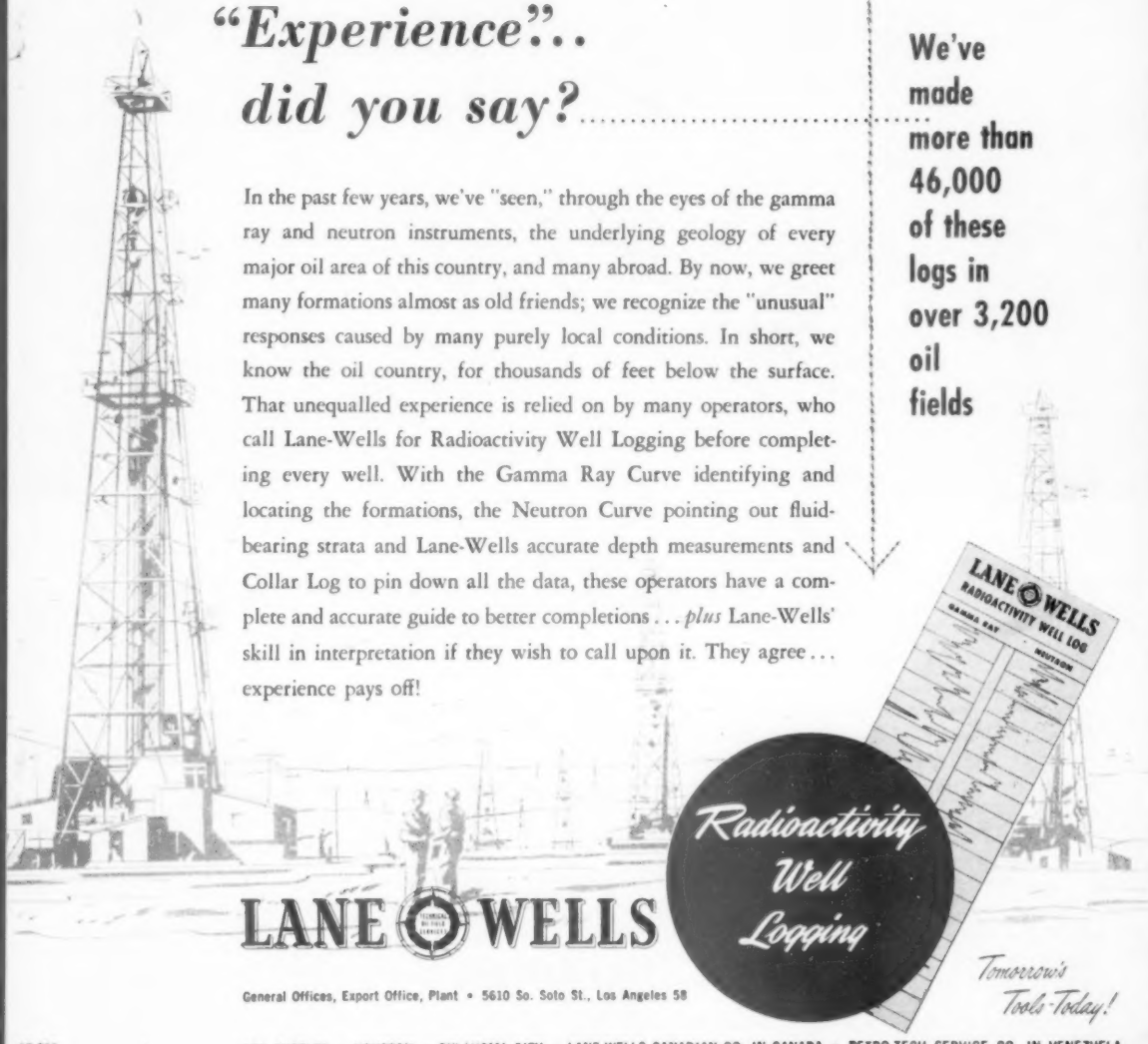
the OIL AND GAS JOURNAL

Two New Oil Recovery Processes

"Experience"... did you say?

In the past few years, we've "seen," through the eyes of the gamma ray and neutron instruments, the underlying geology of every major oil area of this country, and many abroad. By now, we greet many formations almost as old friends; we recognize the "unusual" responses caused by many purely local conditions. In short, we know the oil country, for thousands of feet below the surface. That unequalled experience is relied on by many operators, who call Lane-Wells for Radioactivity Well Logging before completing every well. With the Gamma Ray Curve identifying and locating the formations, the Neutron Curve pointing out fluid-bearing strata and Lane-Wells accurate depth measurements and Collar Log to pin down all the data, these operators have a complete and accurate guide to better completions . . . *plus* Lane-Wells' skill in interpretation if they wish to call upon it. They agree . . . experience pays off!

We've made more than 46,000 of these logs in over 3,200 oil fields



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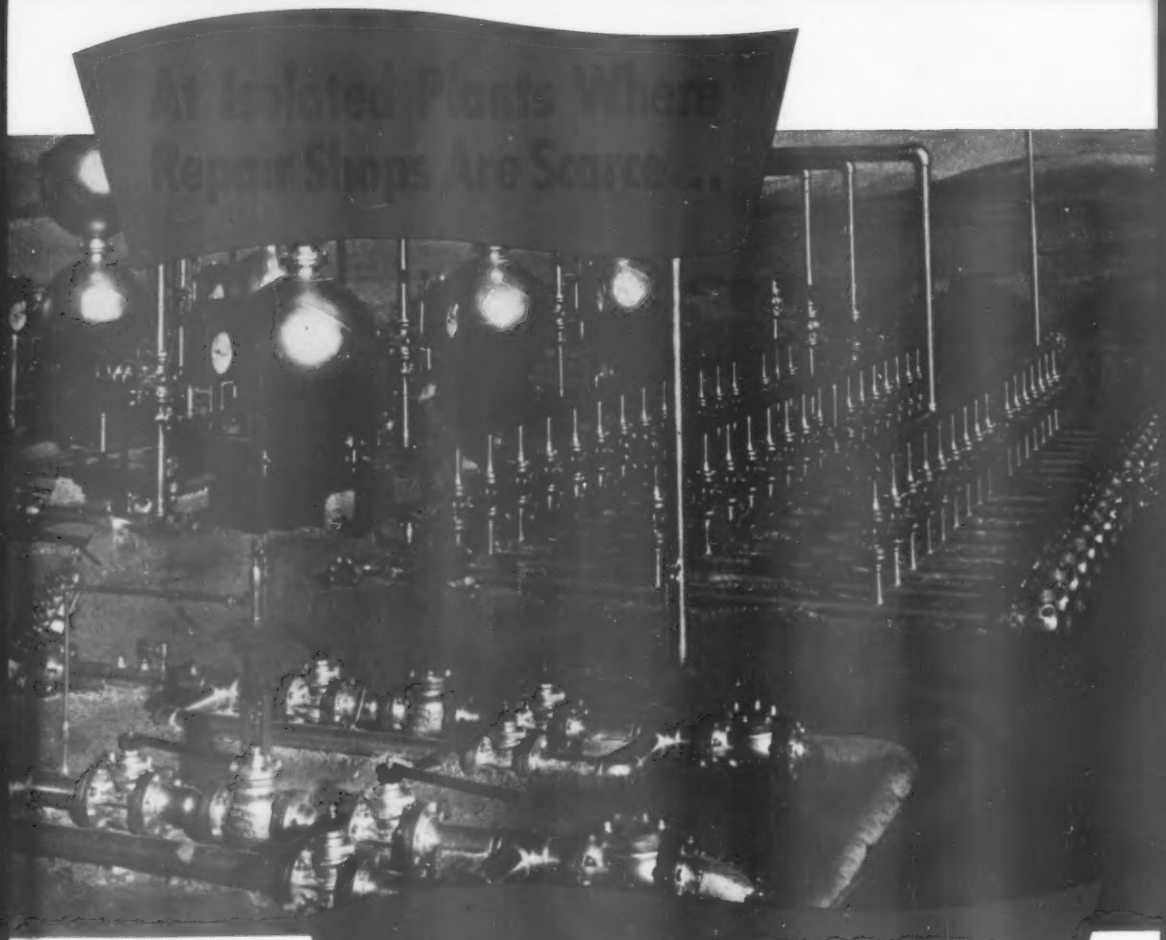

For remote installations, where the nearest maintenance crew may be miles away and shut-downs are especially expensive, the safe thing to do is to standardize on Nordstrom valves. For thirty years, many companies around the world have done so. The record of these thousands of trouble-free installations in isolated areas is the whole record of the growth and acceptance of Nordstrom valves. *Rockwell Manufacturing Company • 400 N. Lexington Ave. • Pittsburgh 8, Pa.*

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Nordstrom Valves
LUBRICANT SEALED TO KEEP UPKEEP DOWN

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Because the Fairbanks-Morse line of "ZC" Engines is so broad, you can pick the size that will best fit your pumping requirements . . . from 3 to 30 hp.

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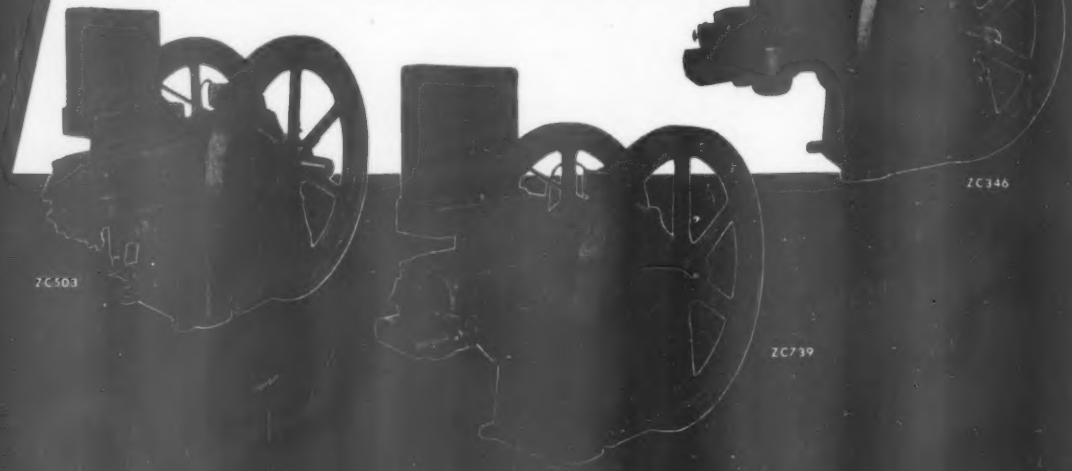

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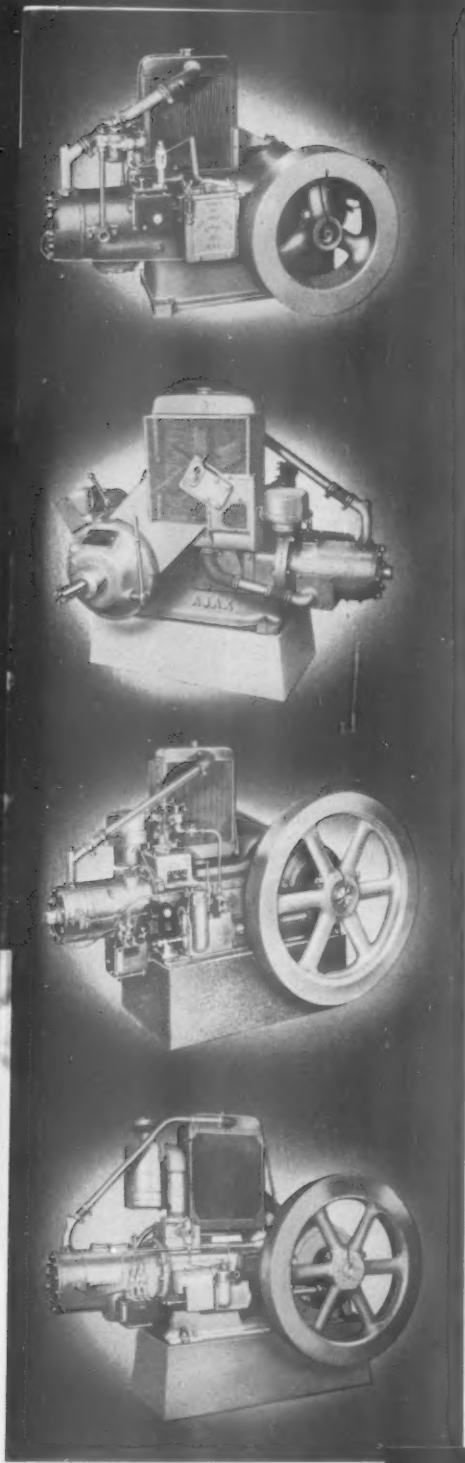

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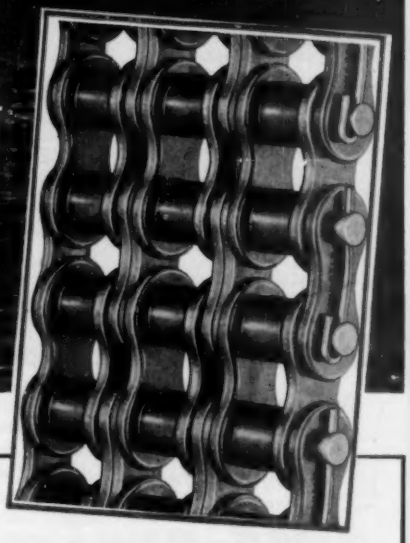

Drillers on offshore, sea-going rigs specify Link-Belt Roller Chain because of its extra service life and the ease of installing and maintaining it.

Nothing but top quality can "cut it". Link-Belt quality is . . .

DESIGNED IN by experts with many years of chain research to draw on.

HAMMERED IN by shot peening the rollers.

BUILT IN by precision manufacturing methods and by uniformly controlled heat treatment.

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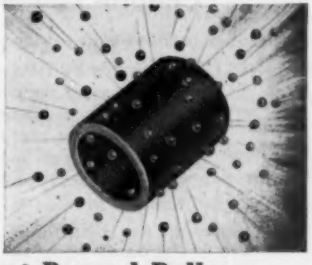
ROLLER CHAINS and SPROCKETS

LINK-BELT COMPANY: Houston 1, Dallas 1, Odessa, Oklahoma City, Los Angeles 33. Distributors in all fields. 12,810

These Link-Belt Features Mean Extra Life, Extra Performance



Shot Peened Rollers

Thousands of tiny steel balls hammer the metal—cold work the surface of each roller —give it extra fatigue life and added ability to withstand shock and impact.

LINK-BELT E-Z Assembly

Patented E-Z Assembly feature permits easy and fast coupling and uncoupling of multiple width chains right on the job.

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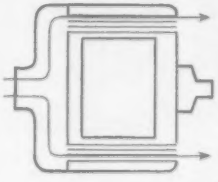
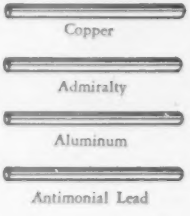


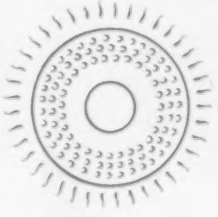
Air-to-air heat exchanger has straight, smooth tubes with no pockets to collect dirt or moisture. Velocity of cooling air through tubes keeps surfaces swept clean. If sticky dirt piles up, tubes can be cleaned quickly with long handled brush.

Choice of Tube Materials



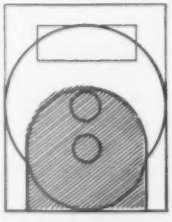
Allis-Chalmers tube-type motors can be built for service in corrosive atmospheres. Tubes may be made of a variety of materials. Motors will carry Underwriters' Label for Class I Group D or Class II Group F or Class II Group G.

Uniform Cooling



Tubes for carrying cooling air are distributed uniformly around the perimeter of the stator and along its full length. Result: heat travels over a short path and the interior is uniformly cooled.

Compact



Allis-Chalmers tube-type motors are little or no larger than open motors of the same rating. Internal compartmentation divides motor into two chambers, keeping pressure at a lower level should an internal explosion occur.

Get Complete Information Now — Ask your Allis-Chalmers district office representative about tube-type explosion-proof motors in sizes up to 2000 hp with Underwriters' Labels to 800 hp. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, and ask for Bulletin 51B7149.

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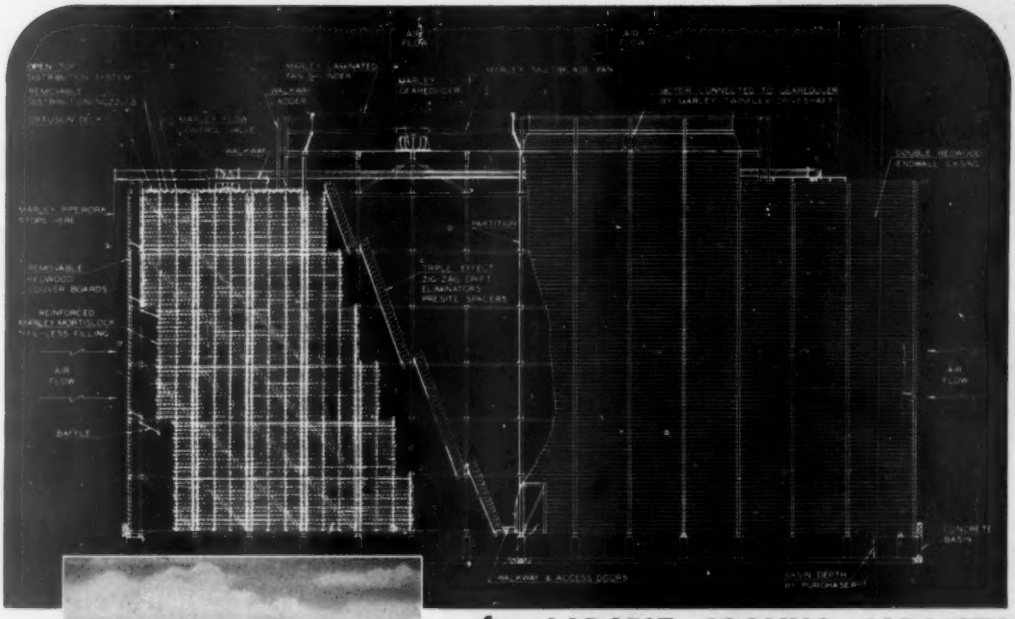

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Twin-Flow cooling towers concentrate maximum cooling ability in every square foot of plant area . . . make fullest utilization of the many exclusive advantages of Marley cross-flow cooling. That's why they deliver largest quantities of cold water at economical cost per gallon.

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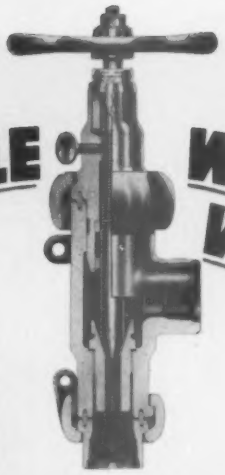
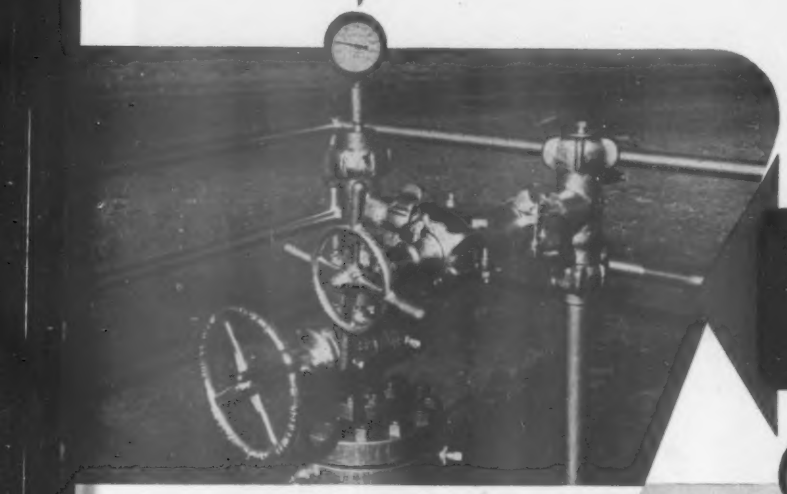
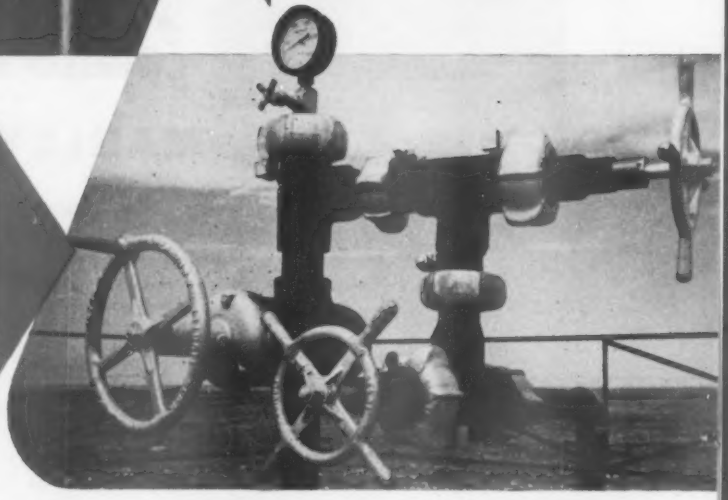
The new UNIBOLT ADJUSTABLE WING VALVE





On high pressure wells, IT'S A DEPENDABLE, LOW COST WING VALVE

On low pressure wells, IT'S A PRECISE, TROUBLE-FREE, ADJUSTABLE CHOKE



The UNIBOLT Wing Valve, designed originally for use as an adjustable choke where well conditions did not demand a positive choke, has become popular with production men as a dependable valve for numerous services where a positive shut-off is essential. Christmas trees for both producing and injection wells, high pressure oil and gas separator manifolds, heater manifolds, meter runs and similar services are made to order for this dependable, yet relatively low-cost, valve. Since high pressure wells are usually produced through a small positive choke, the one-inch opening provided in the UNIBOLT Wing Valve when in full open position is ample to assure unrestricted flow. An additional advantage is the replaceable stem and seat, which may be changed in the field, easily and at low cost. A recent refinement in its mechanical design is the stem packing which, after the valve is assembled at the factory, never requires adjustment or tightening.

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Avondale
service...

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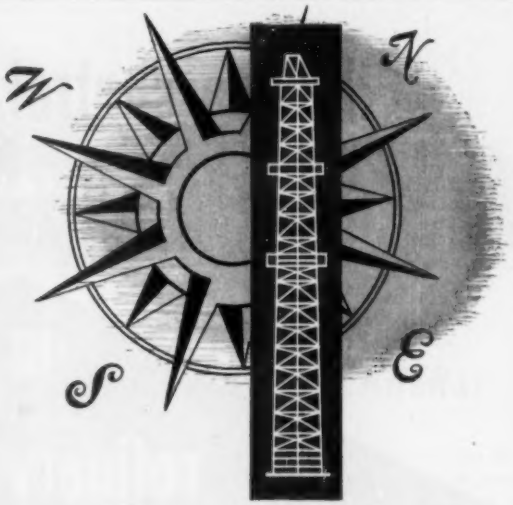

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Slime and algae that thrive in the water of refinery and air conditioning cooling towers are effectively and economically controlled by Monsanto Santobrite. Such control helps maintain peak efficiency of the cooling system and saves the cost of frequent mechanical cleanings.

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If you have a problem of slime and algae in cooling towers, contact the nearest Monsanto Sales Office or write for a copy of Technical Bulletin No. O-15 which gives technical details on Santobrite and tells how to use it. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

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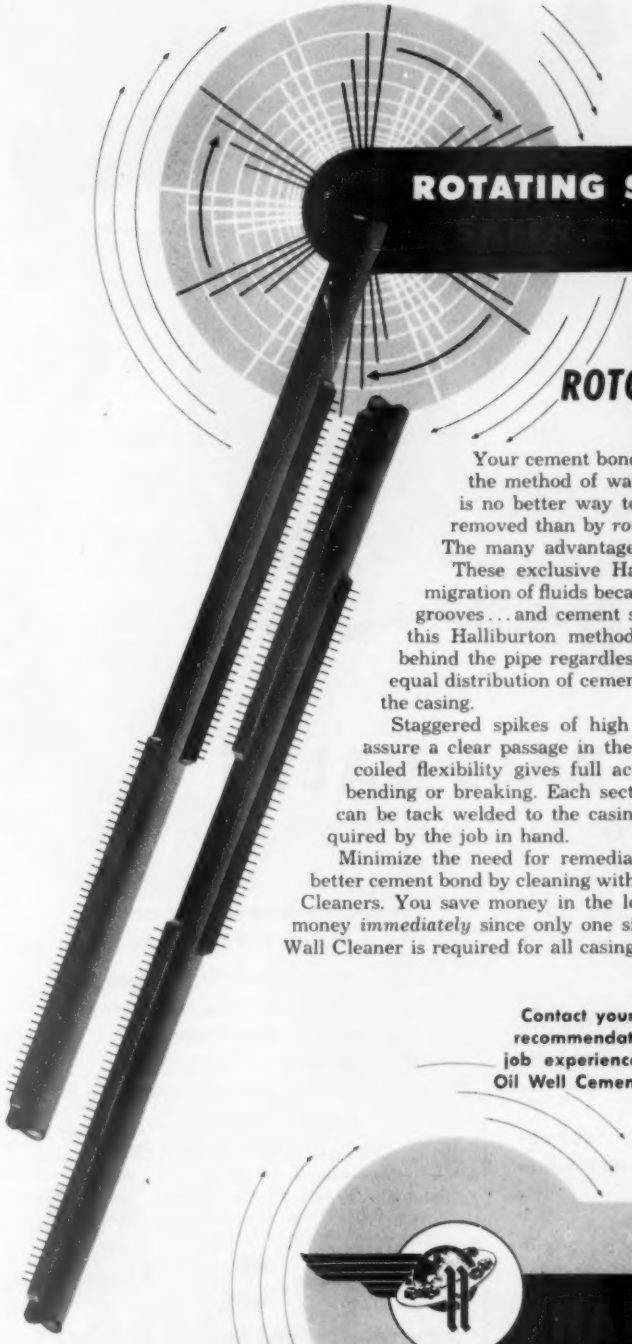

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HALLIBURTON ROTO-WALL CLEANERS!

Your cement bond between pipe and wall is no better than the method of wall cleaning before cementing. And there is no better way to prevent channeling when mudcake is removed than by *rotating* Halliburton Roto-Wall Cleaners. The many advantages are well worth your consideration.

These exclusive Halliburton Cleaners prevent vertical migration of fluids because the rotated spikes cut horizontal grooves . . . and cement sets in clean laminated rings. With this Halliburton method you can be sure of cementing behind the pipe regardless of its position; you get a more equal distribution of cement and a definite aid in centering the casing.

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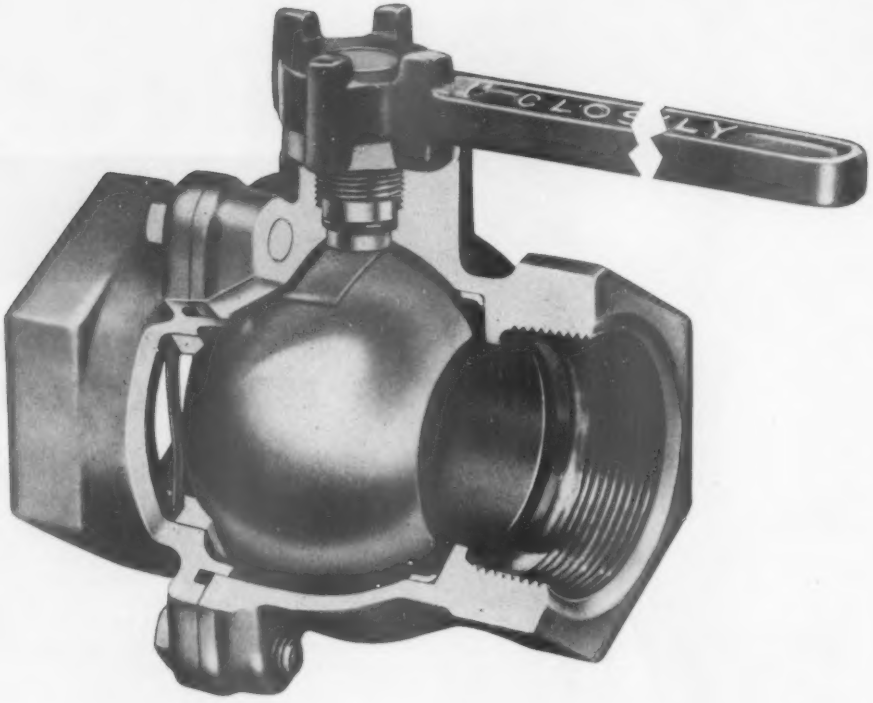
Minimize the need for remedial squeeze jobs! . . . get a better cement bond by cleaning with Halliburton Roto-Wall Cleaners. You save money in the long run and you save money *immediately* since only one size Halliburton Roto-Wall Cleaner is required for all casing jobs!

Contact your nearby Halliburton representative. His recommendation is backed by Halliburton's million job experience throughout the world. Halliburton Oil Well Cementing Company, Duncan, Oklahoma.

HALLIBURTON

YEARS AHEAD IN CEMENTING SERVICE!



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gives you more of what you want in a valve

Full round flow... as full as if there were no valve in the pipe at all. Handles fluids with minimum friction loss . . . without turbulence.

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Resists wear longer . . . chrome-plated floating bronze ball is extremely resistant to scratching, pitting, abrasion.

Stays leakproof . . . When valve is in closed position, pressure of fluid automatically positions ball against synthetic rubber seat to form a tight seal.

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ROCKWOOD

ROCKWOOD BALL VALVES

ROCKWOOD SPRINKLER COMPANY

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"Cash for a Name" CONTEST

$300.00 FIRST PRIZE

$200.00 Second Prize

$100.00 Third Prize

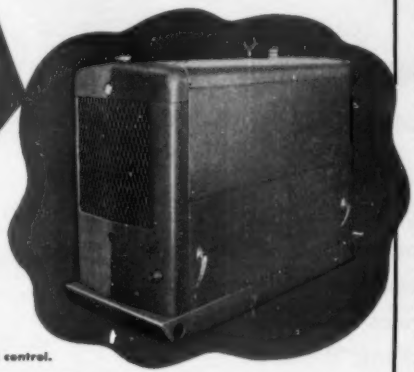
Name this New Gas Engine-driven Welder

Suggest a name for this precision-built, mobile, gas engine-driven field welder. The name should suggest that it is the best self-contained and mobile welding machine in the welding industry.

The best name, in accordance with the rules, will win you $300.00 in cash! Second and third place winners will receive $200.00 and $100.00 respectively.

Study the specifications below. Think of a name that describes ruggedness, stamina and endurance. Remember that this welder is easy to maintain and service because component parts are conveniently accessible. It starts with a quick surge of power and provides a smooth, forceful arc. It's THE welder for all kinds of welding jobs in the field; for pipeline, maintenance and construction jobs.

HERE IT IS!



Specifications

200 amperes, 40 volts, N.E.M.A. Rated. Step-type welding current control, continuous voltage control.

110 volts, 2½ kilowatts auxiliary power.

Liquid-cooled industrial Engine, 1800 rpm. with magneto ignition, automatic idle control and dual manual control.

Skid-mounted. Two- or four-wheel trailer available.

Available with or without instruments, self starter, hoods for complete enclosure.

Exciter is readily accessible.

Weight, approx. 1212 pounds.

Contest Rules

1. This is a naming contest starting June 1, 1952 and ending at midnight July 12, 1952. Contestants are to submit names which, in the opinion of the judges, are appropriate for the new A. O. Smith Gas Engine-driven D.C. Welder described. Each name must be submitted on a separate piece of paper or the coupon from this advertisement together with a brief supporting statement and the legibly written name and address of the contestant. Writing ability will have no bearing on the contest.

2. The three names selected by the judges as best shall be declared the winners of first, second and third prizes respectively. In the event identical names are submitted by different contestants, the ideas contained in the brief supporting statements shall be considered by the judges in selecting prize winners.

3. This is a nationwide contest and is open to readers of this publication and others who use welding equipment, except employees of A. O. Smith Corporation and its advertising agency, and members of their families.

4. In the case of ties, duplicate prizes will be awarded.

5. Winners will be notified by mail, individually. Winners' names will be announced in the September issue of this publication in an advertisement on this new gas engine driven-welder.

6. The decision of the judges will be final. No entries will be returned but will become the property of A. O. Smith Corporation.

7. All entries must be postmarked before midnight of July 12, 1952 and mailed to A. O. Smith Corporation, Welding Products Division, Milwaukee 1, Wisconsin.

8. Entries will be judged by executives of Henri, Hurst & McDonald, Inc., advertising agency.

THIS COUPON MAY BE WORTH $300.00 IN CASH TO YOU!

A. O. Smith Corporation
Welding Products Division, Dept. OG-652
Milwaukee 1, Wisconsin

I offer the following name (and supporting statement) as my entry in your new gas engine-driven welder naming contest:

_____

(write the name you suggest on this line; write supporting statement on margin of this page)

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____

A.O. Smith 78th ANNIVERSARY 1874 - 1952

A.O.Smith
WELDING PRODUCTS

Made by Welders . . . for Welders

Drive at pug mill of Gladding McBean & Co. Safety guard removed for photographic purposes

The Problem:

The drive at the pug mill at the Gladding McBean & Company brick plant, Pittsburg, California, is so vital to their production it cannot be out of service for any length of time. It must operate under dusty conditions which induce slippage in ordinary belts. It must be able to take very severe pulsating loads.

The Solution:

With the installation of rugged BWH Bull Dog V-Belts the problems and difficulties were completely overcome.

* * *

Do you have a drive or V-Belt problem? Call us for Bull Dog V-Belts and a space saving, dependable, trouble-free installation.

Another Quality Product of

BWH DEPENDABLE RUGGEDNESS

BOSTON WOVEN HOSE & RUBBER COMPANY

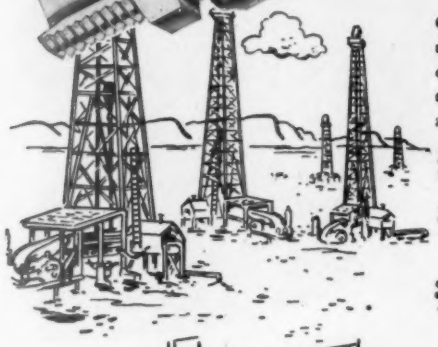
Warehouse Stock: 111 N. Canal St., Chicago, Illinois **Distributors in all Principal Cities**

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

Make Oil-Field Hose Assembly Easier, Faster, Safer

ANC HOR

. . . use Anchor Reusable Couplings with exclusive, patented features



Oil-field equipment manufacturers like Anchor two-piece reusable couplings. Oil-field equipment users like them, also, because you get more for your money with Anchor. You get an exclusive, patented design that saves you time and trouble — a grip that's safer, more dependable. Look at these advantages:

- **Assembly is easy and fast.** All you need is an oil can, a wrench, and a vise. It's that simple!
- **No expensive inventory** of prefabricated hose assemblies. Simply carry one coil in the sizes you use. Cut it to the lengths you need.
- **Anchor's exclusive patented grip** keeps hose assemblies on the job day-in and day-out — prevents leaks and dangerous blow-offs. Couplings can be used over and over again.
- **Downtime reduced.** One of your greatest expenses is cut — costly downtime in the field. Servicing can be performed immediately *without special tools.*
- **Streamlined coupling design** makes possible neat, efficient installations, even in confined spaces.

Anchor makes the most complete line of hydraulic hose assemblies and fittings available. That's why you can select the hose assembly that fits your needs — a hose assembly that lasts longer, performs better, handles easier. For best results, let Anchor go to work for *you.* Send coupon for additional information.

Attach coupon to your letterhead and mail today!

ANCHOR COUPLING CO. Inc.
FACTORY: Libertyville, Ill. • BRANCHES: Detroit, Mich., Dallas, Tex.

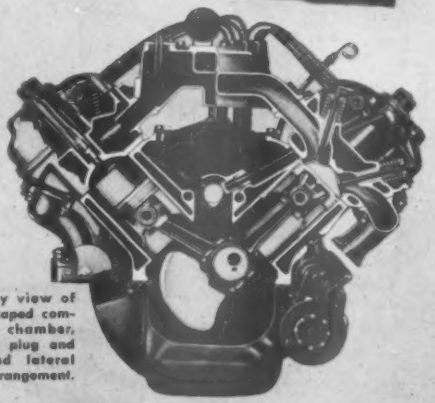
ANCHOR COUPLING CO. INC.
Dept. OG-62, Libertyville, Illinois

Yes, I'm interested in Anchor 2-piece reusable couplings. Send me more information.

NAME..... TITLE.....
COMPANY NAME .....
COMPANY ADDRESS .....
CITY ..... (. . .) STATE.....

CHRYSLER INDUSTRIAL

offers Greater Power, More Efficiency!



Cutaway view of dome-shaped combustion chamber, centered plug and overhead lateral valve arrangement.

Here's why . . . The great new Chrysler V-8 Industrial Engine is completely new in V-8 design. This engine embodies more desirable characteristics than ever before offered to Industrial engine users.

Hemispherical Combustion Chamber provides 33 per cent more horsepower, 16 per cent higher torque. It increases displacement only 3.2 per cent,* yet develops more power for displacement than any comparable engine in Industrial use. *It is today's most nearly perfect combustion chamber!* It allowed many desirable changes in V-8 design—most important of which are larger and wider spaced valves and "free-flow" intake and exhaust porting.

Centered Spark Plugs provide shorter flame travel through fuel. You get greater power from the same amount of fuel; easier, faster starting, *plus* less carbon deposit in the chamber, adding years to engine life.

Overhead Lateral Valves are larger, wider spaced. They operate cooler, eliminating preignition. This ingenious valve arrangement permits gravity flow of the fuel and air mixture into intake and out of exhaust ports—practically eliminates back pressure.

More Efficient Cooling is due to less heat rejection in the combustion chamber. More heat is turned to power. More coolant flows around valves and bore. Water jacket completely surrounds cylinder. With *less coolant* this new engine *has better cooling* —a more compact, efficient, over-all cooling system!

These are only a few of the important developments made in Chrysler Industrial V-8's. There are many more. *These* engines will give you a whole new conception of Industrial power. Ask a Chrysler Industrial Engine Dealer to explain their advantages on your jobs, or write us direct for full information. **Marine and Industrial Engine Division, Chrysler Corporation, 12200 E. Jefferson Ave., Detroit 31, Michigan.**

*Model IND-40

CHRYSLER
Industrial Engines

STAINLESS STEEL

ALUMINUM

NEED METALS?

INCONEL* BRASS NICKEL* COPPER STEEL MONEL*

Sheet, Plate, Tube, Pipe, Wire, Rod and Bar, Extrusions, Structural Shapes . . . and the following INDUSTRIAL PRODUCTS: Fasteners, Tube Fittings, Pipe Fittings, Valves, Silver Brazing Alloy, Welding Material, Solder, Castings, Tube Expander Equipment, Liquid Plastic Protective Coating, Metallic Caulking Compound, Aluminum Metal Trim, Waterproof Barriers, Nails, Handrail Fittings, Low Melting Alloys, Aluminum Jacketing, Wire Cloth and Rope, and "O" Rings.

Precision Equipment for Shearing and Slitting.

*Not stocked in Kansas City or St. Louis territories.

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METAL GOODS CORPORATION

Call, wire, or write nearest Metal Goods Corporation Representative:

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Kansas City 16, Mo.
1300 Burlington
Frank D. Hogan
Phone: NOrday 3516

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302 North Boston
Scott J. Harrison
Phone: 4-1175

Houston 3, Texas
711 Milby Street
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Phone: CEntral 8881

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2425 Walnut Street
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Phone: AComa 5891

Dallas 9, Texas
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Phone: CAnal 7373

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781 Raymond Road
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Phone: 3-2711

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Phone: 8-1314

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Phone: 4-4738

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1333 N. Pennsylvania
Phone: Lincoln 4980

Memphis, Tennessee
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Phone: 5-8721

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924 State Street
Robert L. Tharp
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Phone: FOrtune 4369

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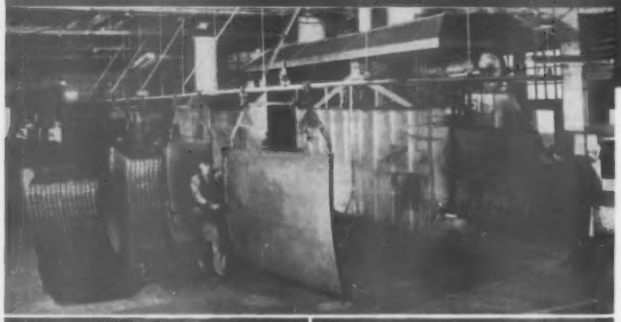
Roy D. Bagsley
Phone: GArfield 3161

M C



REPRESENTATIVES AT THESE PRINCIPAL OIL CENTERS

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*Service available **Stocks and Service available

OVEN TREATMENT TO 700° PROVIDES MORE DURABLE PAINT BOND

One reason why M.C. bolted tanks are superior is that each sheet is oven heated by the Maloney-Crawford EXCLUSIVE process (shown at left) to 700° F. to remove all scale and film before paint is applied. While still hot, the sheets are painted with primer and rust inhibited second coat. The "drying from inside" process provides an especially firm bond with the steel.

AUTOMATIC WELDING, FLANGED DECK AND BOTTOM PROVIDES GREATER STRENTH

One reason why M.C. welded tanks are superior is that they are automatically welded and decks and bottoms flanged (as shown at left) to provide greater strength. In addition, each tank is hydrostatically tested to insure freedom from leaks.

MALONEY CRAWFORD

MALONEY-CRAWFORD TANK & MFG. CO

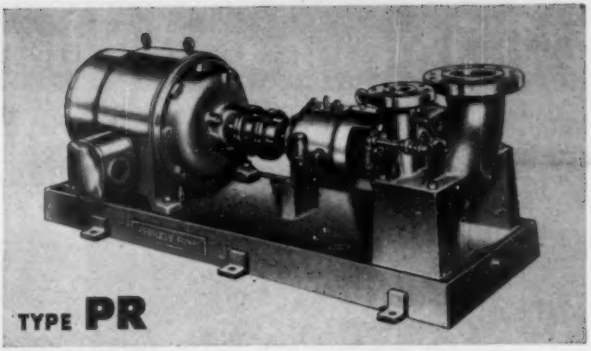
FACTORY AND GENERAL OFFICE: 38 N. Peoria—Box 659—Tulsa, Oklahoma
EXPORT REPRESENTATIVE: Baird Lines, 420 Lexington Avenue, New York, N. Y.
CANADIAN REPRESENTATIVE: Maloney-Crawford of Canada, Ltd., Edmonton, Canada
TEXAS PANHANDLE REPRESENTATIVE: H. W. Waddell, Pampa, Texas

designs

TO SUIT THE APPLICATION

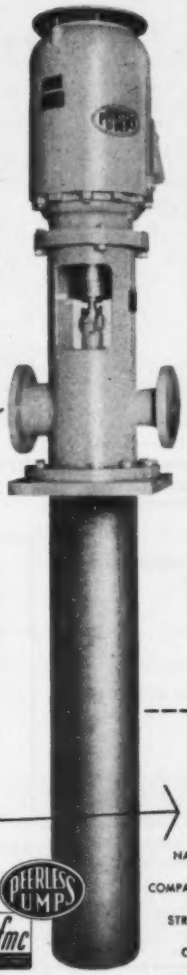
VERTICAL

HORIZONTAL



TYPE **PR**

PEERLESS PUMP



like **THE PEERLESS HYDRO-LINE** **A HIGH PRESSURE, MEDIUM CAPACITY, BOOSTING AND CIRCULATING PUMP.** Packing gland or mechanical shaft seal construction available. Especially suited to condensate return service and for handling hydrocarbons, hot or cold water and mild salt solutions at temperatures from 0°F to 400°F. This encased, close-coupled, vertical, turbine pump is ideal for limited NPSH application in field and refinery service and for installations where space is at a premium. Its construction flexibility ideally suits it to future as well as present system needs. Easiest to install, operate and maintain. Use coupon below for Bulletin No. B-592 which describes construction details and operating characteristics.

like **THE PEERLESS TYPE PR** **A HIGH TEMPERATURE, HIGH PRESSURE PROCESS PUMP.** Packing gland or mechanical shaft seal construction available for handling hydrocarbons, water and chemical solutions at high temperatures and pressures. Designed with more than a score of engineered features that add up to real process pump superiority. Here are a few advantages: maximum parts interchangeability, extra low NPSH requirements, availability in various alloys, end or top suction design, complete range of sizes. Use the coupon below for Bulletin No. B-1605 which describes construction details and operating characteristics.

SELECT YOUR PUMP FROM THE COMPLETE PEERLESS LINE

A pump for every purpose is more than a Peerless slogan, it's a Peerless fact. Whether your requirements call for a vertical pump or a horizontal pump, Peerless can furnish the pump to meet your specifications from its complete line. You can choose from scores of Peerless types, hundreds of Peerless models for thousands of pumping applications. Peerless service is nationwide. Call the office nearest you for a Peerless field engineer. He can help you buy and apply the right pump from Peerless' comprehensive and complete line.

MAIL COUPON TODAY

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Address inquiries to Factories at:
Los Angeles 31, California and Indianapolis 8, Indiana
Offices: New York, Chicago, St. Louis, Atlanta, Tulsa, Dallas, Plainview and Lubbock, Texas; Fresno, Los Angeles; Phoenix, Albuquerque, New Mexico.

PEERLESS PUMP

fmc

PEERLESS PUMP DIVISION
Food Machinery and Chemical Corporation
301 West Avenue 26
Los Angeles 31, California

Please send us a copy of the following bulletins:

☐ HYDRO-LINE PUMP ☐ TYPE PR PUMP

NAME_____

COMPANY_____

STREET_____

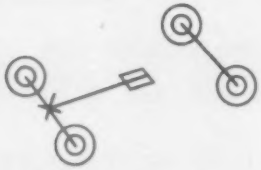
CITY_____ STATE_____

O&GJ

Is Traction on Rubber Your Problem?

Let's investigate this traction problem on rubber tires:

1 **Your Automobile . . .**



Both rear wheels drive only if they have equal traction, but if one tire is on a slippery spot, that wheel spins around and the other wheel stands still. You have been stuck in mud or snow!

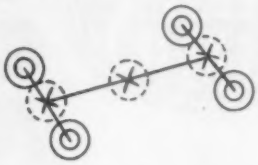
2 **More traction required? Definitely! Let's put on a Front Wheel Drive Conversion. Now you have a 4 x 4.**

Some improvement, but still with only one tire, front or rear, on a slippery spot, that wheel spins around, the others all stand still. You are stuck again. There must be some way to get more pushing power!

3 **How about this? Let's lock the center differential—manually or automatically.**

Automatically would be best. Now we are sure of driving one front and one rear wheel. But, if one front tire and one rear tire are on slippery spots, those wheels spin, the others stand still. You're stuck again. Can this be improved?

4 **Sure! Why not have Three Automatic Locking Differentials? Front, Center and Rear. That's the logical answer.**



Has anyone ever done it? Why that system has been in successful use for over thirty years. That's the WALTER FOUR POINT POSITIVE DRIVE. How is it done? With the Walter Drive, three automatic lock or torque proportioning differentials maintain positive drive to all four wheels. The tires that have the best traction get more power, all wheels keep on driving! There is no wheel spinning!

THINK IT OVER . . . ISN'T IT TRUE?

If traction on rubber is your problem . . .

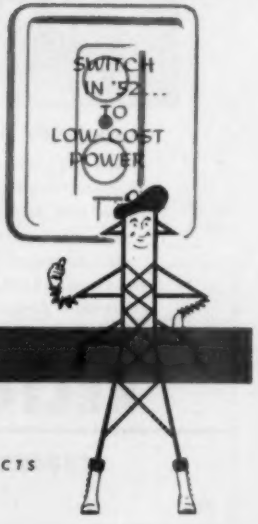
WALTER
FOUR POINT POSITIVE DRIVE
is the answer!

WALTER MOTOR TRUCK CO.,
1001-19 Irving Ave.,
Ridgewood 27,
Queens, L. I., N.Y.

WALTER
4-POINT POSITIVE DRIVE
TRACTOR TRUCKS

. . . to cut costs the Petroleum Industry has switched to *Electric Power*

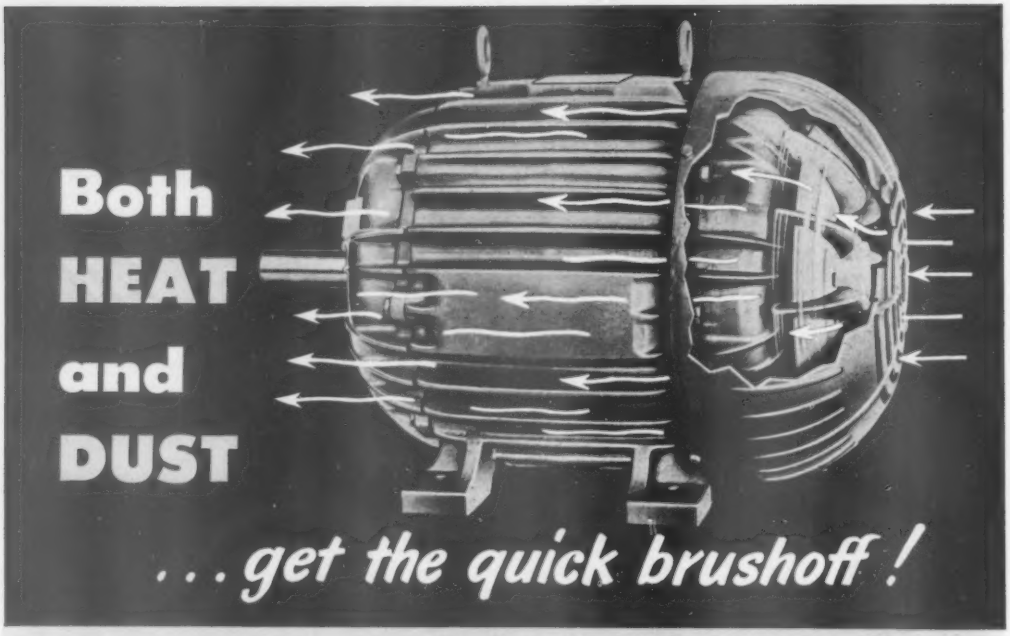
Pipe line operators discovered many years ago that Electric Power was the answer to lower power cost. Regardless of the job to be done in moving fluid, Electric Power usually can do it more satisfactorily — *and for less.* Above is shown an application by a major oil company near Antioch, Oklahoma, utilizing 1-200 H.P. and 1-75 H.P. and several smaller pump motors for pumping crude oil. Electric Power is also used for tank gauging. Your power problems can be simplified, too, by using Electric Power. Let us PROVE IT TO YOU — now.



Petroleum Electric Power Association

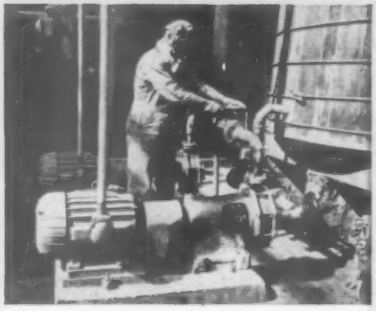
ORGANIZED IN THE INTEREST OF GREATER SERVICE TO THE PETROLEUM INDUSTRY

CALL YOUR NEAREST ELECTRIC SERVICE COMPANY FOR MORE FACTS
OR ADDRESS YOUR REQUEST TO P. O. BOX 2771, DALLAS, TEXAS



ELLIOTT CROCKER-WHEELER

Sealedpower MOTOR



WHERE EVEN THE AIR HAS TEETH

containing fumes so corrosive that in this chemical plant the operator turning the valve must wear rubber gloves and a face-mask. The two *Sealedpower* motors wear just their totally enclosing jacket, and keep cool and clean with no trouble. This sort of thing is all in the day's work for *Sealedpower* motors.

"Keep moving" says the cowl-directed air blast to heat, dust and dirt, as it sweeps along the radiating fins of the motor's outer case. This totally-enclosed fan-cooled *Sealedpower* motor, with its eleven-year service record, has worked in so many tough spots that its ability to take the worst you can hand it is proven beyond question. Its name, *Sealedpower*, means what it says—power that's sealed in, immune to outside conditions, with the plus factor of radiating fins and the air blast to take away heat and prevent dust from settling. *Capacities 3 to 125 hp. Also explosion-proof, underwriters approved, in most ratings. Bulletin on request.*

ELLIOTT Company

CROCKER-WHEELER DIVISION
AMPERE, N. J.

For large motors: RIDGWAY DIV., RIDGWAY, PA.
Plants at: JEANNETTE, PA. • RIDGWAY, PA. AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES
ELLIOTT APPROVED SERVICE SHOPS COVER THE COUNTRY

W2-10

Long heat exchanger tube life starts here!

CHASE ANTIMONIAL ADMIRALTY

(A patented alloy)

Thousands of installations since 1935 prove that Chase Antimonial Admiralty* adds years of service to heat exchanger life.

Chase Antimonial Admiralty has *enough* antimony to resist dezincification. And antimony does not lessen resistance to other forms of corrosion . . . keeps tubes tough and rugged under heavy-duty assignments.

FREE BOOK — Send for the new Chase book discussing problems of corrosion in condenser and heat exchanger tubes, selection of proper alloy, and information on installing tubes. Fill in coupon below.

*U. S. Patent No. 2,061,921

NEW BOOK includes Specifications, Weights, Dimensions and other data.

SPECIAL STOCKS OF ANTIMONIAL ADMIRALTY TUBES are carried in our NEW YORK, BALTIMORE, NEW ORLEANS, LOS ANGELES Warehouses. *Also carried by* Vinson Supply Co., Tulsa, Standard Brass & Mfg. Co., Houston.

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Chicago	Houston†	Newark	Rochester†	
Cincinnati	Indianapolis	New Orleans	St. Louis	

Chase Brass & Copper Co., Dept. OGJ 652A
Waterbury 20, Conn.

Please send me your free book on Condenser and Heat Exchanger Tubes.

Name_____

Firm_____

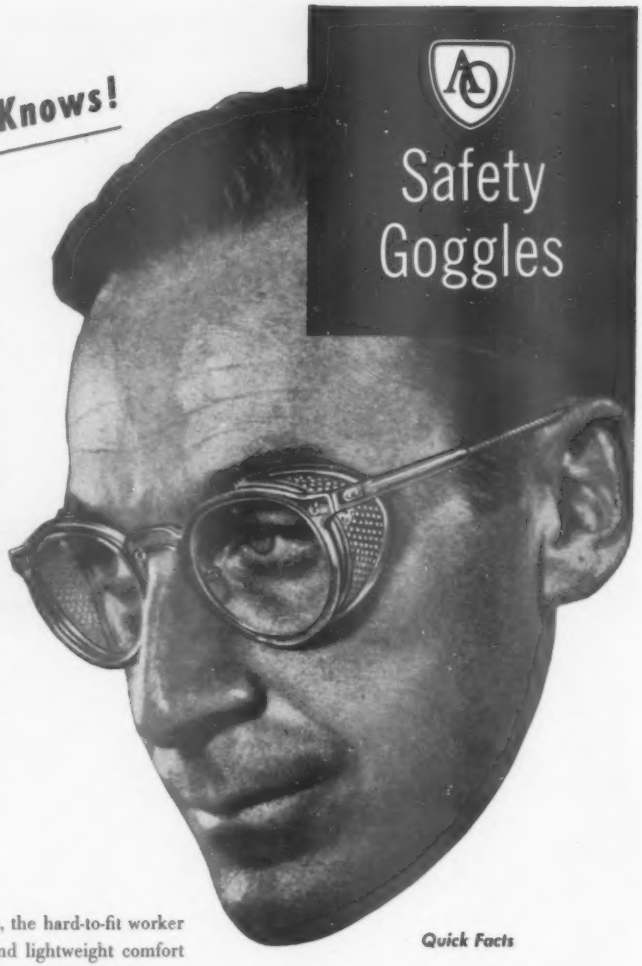
Position_____

Address_____

City_____ State_____

The Worker's Nose Knows!

Adjustable Nose Pads of **AO FX9200 GOGGLE** Make it Easy to Fit the Hard to Fit



Now with the new AO FX9200 goggle, the hard-to-fit worker can enjoy the safety, unobstructed vision and lightweight comfort which the AO FX9200 series goggle provides. Non-corrosive nose pads of thin cellulose acetate adjust for perfect fit easily . . . and they are removable for quick replacement just as easily. "Rocking" nose pad construction distributes goggle weight broadly for pressure-free comfort. The FX9200 is particularly recommended with prescription Super Armorplate lenses, with or without side shields. Your nearest AO Safety Products Representative can supply you.

Quick Facts

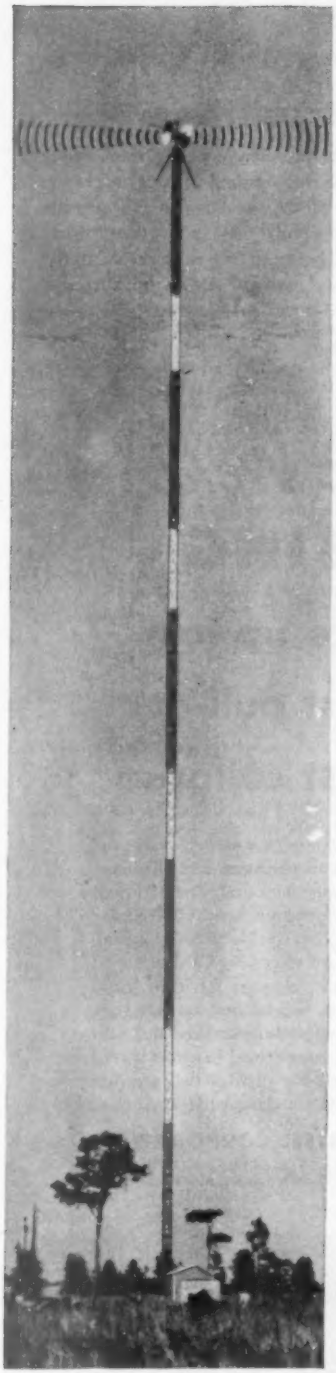
- Hinges and temples out of line of sight for unobstructed vision
- Lenses conform to eye orbit for better vision and looks
- Comfort cable or skull temples
- Side shields of perforated acetate to prevent lens fogging
- Keyhole bridge for extra protection and snug fit

AO's Industrial Vision Program Increases Production, Decreases Accidents. Write today for booklet "Improved Industrial Vision" to 61 Vision Park, Southbridge, Mass.

American Optical
SAFETY PRODUCTS DIVISION

Register and Vote!

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES



LIGHT-WEIGHT G-E ANTENNAS, top, reduce cost of supporting towers.

UNATTENDED STATIONS are controlled by microwave from dispatcher's office. Motors are switched, valves adjusted, station information relayed.

Microwave remote control holds pumping costs down

G-E engineering co-ordinates complete system to improve station operation, boost throughput

Many owners of long-haul oil pipelines are faced with the problem of linking pumping stations together by remote control, efficiently, economically. Often, the answer is microwave. Here's why.

1. Bad weather can't cause breakdowns
2. No expensive wire circuits needed
3. Owner has complete channel control
4. Up to 24 channels available
5. Phone communication is possible

Find out how G-E application engineers use a combination of G-E microwave and supervisory equipment to design remote-control systems that cost less per communication-mile. Contact your G-E Apparatus sales office or write for Bulletin GEA-5745. General Electric Co., Section 661-36, Schenectady 5, N. Y.

Engineered Electric Systems for Oil Pipelines

GENERAL ELECTRIC

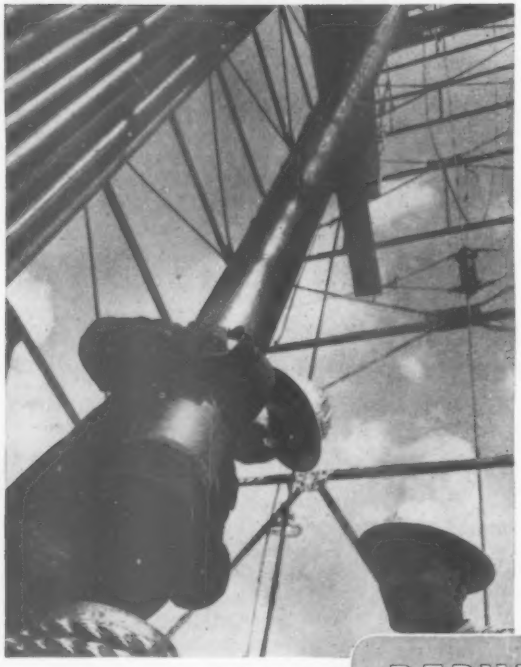
How to keep threads in top condition

Reminders of Good Casing Practices:

Do not remove protector from field end of casing until ready to stab. Apply thread compound over the entire surface of the threads just before stabbing. The brush or utensil used in applying thread compound should be kept free of foreign matter and the compound should never be thinned.

—Reprinted by permission from "API Recommended Practice RP5C1: Care and Use of Casing, Drill Pipe and Tubing."

REPUBLIC *Electric Weld* CASING and TUBING



- **Make up fast**
- **Resist pull-out**
- **Resist collapse**

. . . because they're uniformly round, uniform in wall thickness and diameter, uniformly strong and sound. These Electric Weld tubular products are cold-formed from high ductility steel—and fully normalized for uniform structure. Casing is cold sized to further increase its high yield strength. Clean, full-formed threads stab, spin-in and tong-up fast—and tight. A uniform depth of tough steel beneath thread roots all around the pipe guards against pull-outs. Write for descriptive literature.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

REPUBLIC *Electric Weld* STEEL
NORMALIZED CASING AND TUBING

Other Republic Products include Line Pipe—Carbon, Alloy and Stainless Steels—Upson Studs, Bolts and Nuts—Electrunite Heat Exchanger Tubes

They Say—

Death to Controls!

"The need for price and wage controls is rapidly passing, if it has not already passed. We believe that price and wage controls are inappropriate instruments for the control of inflation except in times of great emergency. No emergency now exists which requires their use.

"We believe that the price and wage control provisions of the Defense Production Act should be extended only to December 31, 1952, and that a vigorous policy of selective decontrol should be adopted at once. The 6 months remaining before price and wage control authority expires will permit an orderly return to free markets.

"In our opinion continuation of price and wage control authority after this year will be unnecessary and undesirable unless a new and serious international crisis should occur."

Statement of the Committee for Economic Development, New York.

Ducking the Limelight

"The highest gasoline tax rate in the nation will be abandoned on Labor Day when Louisiana's 9-cent per gallon rate drops to 7 cents. The gasoline tax reduction bill—H.B. No. 1—passed the entire legislature with only one dissenting vote and has been signed by Governor Kennon as promised before his election earlier this year.

"The tax cut follows continuous protests by highway users since the 9-cent state rate was adopted in June 1948. The protests reached a climax this year and became a principal issue in the recent elections. It is estimated the tax cut will save motorists more than $10,000,000 annually."

News Digest, American Petroleum Industries Committee.

Iran in Court

"Iranians, through Dr. Mossadegh, have made two things clear: First, they are convinced that the (World) court has no jurisdiction, and, secondly, if the court claims it has jurisdiction, its decision 'will make no difference to their intention to follow the road they have chosen.'

"Therefore it is obvious that the British are not going to get much satisfaction in the way of oil or equipment in Iran, whatever happens. However, a judgment favoring the British would have moral and practical value, both to Britain and to other countries which might find themselves in the same fix.

"The British problem now is to persuade the court that the 1933 contract which the Iranians broke was an international convention and hence that the court is competent to decide a dispute in connection with it."

Editorial in the New York Times.

Independence vs. Authority

"Government control of our industry and government intervention to give competitive advantages to any member or part of the industry are, we think, as bad for our customers' welfare as our own.

"It seems to me that most of the perplexities of our times boil down to the dilemma of independence as opposed to central authority.

"In many places today individuals and institutions—through force or by choice — are surrendering their independence. The resulting moral decay is sickening the whole world."

Eugene Holman, president of Standard Oil Co. (N. J.), addressing the In-

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There is a difference in needle valves . . . and O-C-T makes the difference

O-C-T Needle Valve bodies are single piece drop forged steel. The male thread is made as an integral part of the valve which gives you a more compact, stronger connection. This one-piece O-C-T Needle Valve design eliminates the use of nipples and minimizes the chances for leakage. Buy O-C-T Needle Valves from your supply store. There is a difference . . . and O-C-T makes the difference!

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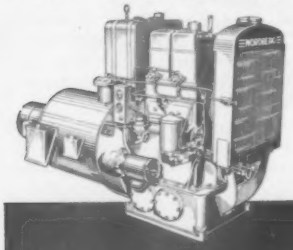

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• Nordberg Type 4FS "Packaged" Diesel Power Units were developed to meet the need for simple, compact, dependable units capable of continuous heavy duty service. They are built in 1, 2, and 3-cylinder models, developing from 10 to 45 horsepower or 6,000 to 30,000 watts at medium engine speed to stand the gaff of all kinds of tough jobs.

The 4FS series incorporates the same high standards of design, construction and performance that have been identified with world-famous Nordberg Diesels for over 35 years. For electric power, for pumping, for energizing lifting magnets, and for scores of straight power applications . . . you just can't beat the reliability, low operating cost and minimum maintenance offered through the use of Nordberg 4FS Diesels.

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Nordberg Mfg. Co., Milwaukee, Wisconsin

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Company Name

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City Zone State

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dependent Oil Men's Association of New England.

Table of Contents Change

Sir:

I notice your June 16 issue of The Oil and Gas Journal carries the Table of Contents on Page 1.

I wanted you to know that we think this is certainly an improvement over the former policy of having the index somewhere in the issue.

It makes it much easier to refer back to the first page when you are looking for an article than to have to find the index somewhere in the issue.

I think this is a definite improvement and would like to congratulate you on it.

James J. Kelly
Manager, Refining Division
Kerr-McGee Oil Industries, Inc.,
Oklahoma City

More Than One Seizure

Sir:

The Supreme Court in rendering its decision on the presidential seizure of the steel mills surely prohibits the seizure of property by anyone or any method.

If the President of the United States can not seize property as ruled, this decision should prevent John L. Lewis or Philip Murray or any organization from seizing an industry by:

A.—Sit-down strike.

B.—Picketing.

Norman L. Stevens
Bangor, Mich.

CALENDAR

JULY

21-25 National Conference on Clays and Clay Technology, University of California, Berkeley.

AUG.

1- 3 Wyoming Geological Association, field trip, Big Horn basin.

11-13 Society of Automotive Engineers, national West Coast meeting, Fairmont Hotel, San Francisco.

18 Illinois Oil & Gas Association and Illinois Basin chapter of American Petroleum Institute, annual mid-summer Oil Men's Outing, Meadow Woods Country Club, Centralia, Ill.

19-22 American Institute of Electrical Engineers, Pacific general meeting, Westward Ho Hotel, Phoenix, Ariz.

25-27 Twelfth Annual Appalachian Gas Measurement Short Course, West Virginia University, Morgantown, W. Va.

SEPT.

1- 3 Interstate Oil Compact Commission, fall meeting, Banff, Canada.

3- 5 Pacific Coast Gas Association, Ambassador Hotel, Los Angeles.

4- 5 Rocky Mountain Oil & Gas Associa-

3 to 5 times Longer Life
for Your Lubricated
PLUG VALVES
BY LUBRICATING THEM
Automatically!

EVERY TIME...

. . . they're OPENED and CLOSED

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This simple, fool-proof low priced device forces a measured amount of lubricant into the valve *automatically* each time it is opened and closed. Ideal for those frequently used valves on:

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Pipe of Mayari R Used at Compressor Stations on Texas-New York Gas Line

At the compressor stations on its 1840-mile Texas-New York gas line, the Transcontinental Gas Pipe Line Corporation specified steel pipe made of Mayari R, Bethlehem's low-alloy, high-strength steel. The pipe was fabricated by Bethlehem from ½-in. and ¾-in. Mayari R plate, and was made in sizes from 24 in. to 30 in. At each of twelve widely separated pumping stations it was joined directly to the compressor and into the main line.

Bethlehem Pipe made from Mayari R was chosen for these highly stressed locations because of Mayari R's ability to withstand shock loadings caused by vibration. This ability is the result of Mayari R's excellent fatigue properties (endurance limit 50,000 psi), and its high yield point (50,000 psi min). Besides, Mayari R is an ideal pipe to weld.

Whether it is made from Mayari R steel for some special application involving severe stresses, or from carbon steel for normal pipe-line service, you can count on economy and good performance when you use Bethlehem Oil and Gas Pipe. This high-quality pipe is ideal for distribution-line service in any location because it can be made to meet the requirements of any of these three specifications: API 5LX42, ASTM A-139, and ASTM A-134.

Bethlehem Oil and Gas Pipe comes in 40-ft lengths, with beveled or square ends, and in all practical diameters, starting with a minimum of 22 in. ID. We have complete facilities for grit-blasting, priming, enameling and wrapping, as well as for the manufacture of tees, crosses, and other fittings.

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BETHLEHEM OIL and GAS PIPE

tion, refining committee, Newhouse Hotel, Salt Lake City.

8-12 Instrument Society of America, seventh national instrument conference and exhibit, Cleveland.

10-12 National Petroleum Association, fiftieth annual meeting, Hotel Traymore, Atlantic City, N. J.

11-13 American Institute of Chemical Engineers, regional meeting, Palmer House, Chicago.

25-26 Western Petroleum Refiners Association, regional meeting, Hotel Henning, Casper, Wyo.

28-30 American Association of Oilwell Drilling Contractors, annual meeting, Skirvin Hotel, Oklahoma City.

OCT.

1- 3 American Institue of Mining and Metallurgical Engineers, Mid-Continent fall meeting, Rice Hotel, Houston.

1- 3 National Association of Corrosion Engineers, South Central Region, technical program and committee meetings, Jung Hotel, New Orleans.

1- 3 American Institute of Mining and Metallurgical Engineers, Mid-Continent fall meeting, petroleum branch, Rice Hotel, Houston.

2- 3 Petroleum Electric Power Association, twenty-third annual meeting, Mayo Hotel, Tulsa.

4 John Zink Process Heating seminar, John Zink Co. plant, Tulsa.

6 Independent Natural Gas Association of America, annual meeting, Fontenelle Hotel, Omaha, Neb.

9-10 California Natural Gasoline Association, twenty-seventh annual fall meeting, Ambassador Hotel, Los Angeles.

13-15 Texas Mid-Continent Oil and Gas Association, thirty-third annual meeting, Hotel Texas, Fort Worth.

13-17 American Institute of Electrical Engineers, fall meeting, New Orleans.

16-19 Permian Basin Oil Show, Odessa, Tex.

19 Natural Gasoline Association of America, southern regional meeting, Blackstone Hotel, Tyler, Tex.

20-21 Independent Petroleum Association of America, annual meeting, Mayo Hotel, Tulsa.

22-24 Society of Automotive Engineers, national transportation meeting, Hotel William Penn, Pittsburgh, Pa.

22-24 American Institute of Mining and Metallurgical Engineers, West Coast fall meeting, petroleum branch, Statler Hotel, Los Angeles.

23-24 American Institute of Mining and Metallurgical Engineers, West Coast fall meeting, Statler Hotel, Los Angeles.

24-25 Independent Petroleum Association of America, annual membership meeting, Skirvin Hotel, Oklahoma City.

27-31 American Gas Association, annual convention, Atlantic City, N. J.

30-Nov. 1 Rocky Mountain Oil and Gas Association, annual meeting, Cosmopolitan Hotel, Denver.

NOV.

3- 4 Society of Automotive Engineers, national diesel engine meeting, Chase Hotel, (tentative), St. Louis, Mo.

6- 7 Society of Automotive Engineers, national fuels and lubricants meeting, Mayo Hotel, Tulsa.

6- 8 Gulf Coast Association of Geological Societies, annual fall meeting, Hotel Driscoll, Corpus Christi, Tex.

8-13 Oil Industry Information Committee, Conrad Hilton Hotel, Chicago.

10-13 American Petroleum Institute, thirty-second annual meeting, Conrad Hilton Hotel and Palmer House, Chicago.

13-14 Society of Exploration Geophysicists, midwestern meeting, Texas Hotel, Fort Worth.

20-22 Instrument Maintenance Short Course, jointly sponsored by Southern California Meter Association and Los Angeles Harbor Junior College.

30-Dec. 5 American Society of Mechanical Engineers, Statler Hotel, New York City.

DEC.

5- 6 Interstate Oil Compact Commission, winter meeting, Wichita, Kans.

7 Natural Gasoline Association of America, Panhandle-Plains regional meeting, Herring Hotel, Amarillo, Tex.

7-10 American Institute of Chemical Engineers, annual meeting, Hotel Cleveland (Hqs.) and Carter Hotel, Cleveland.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

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With the WELD that Never Fails!

Kerrigan grating is a one-piece INSEPARABLE unit. Bearing bars and crossbars are WELDFORGED by Kerrigan's exclusive process into ONE PIECE. Resulting grating is a strong, anti-slip, easy-to-clean grating that affords maximum light and ventilation, a minimum of installation and maintenance expense, and long years of trouble-free use.

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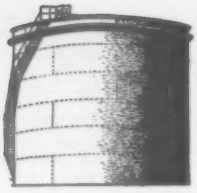

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Now—for the first time, a floating roof that utilizes *Full Tank Height!* When empty, the roof actually rests on the tank bottom without pipe supports. The *Full Travel* enables you to utilize the full capacity of the tank for conservation storage.

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TULSA, OKLAHOMA

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ABC Audit Bureau of Circulations
Associated Business Papers
ABP

JOURNALLY Speaking

In Darkest Africa

WE get around, all right. Here's an illustration of our favorite oil publication bringing light to the Dark Continent, pictorial proof of our world-wide circulation and universal appeal. It was sent us by a loyal subscriber with this explanation:

"I enclose a picture I took about 2 months ago in Nyasaland, Central Africa, and it illustrates another use for your versatile publication. I always hate to throw away a copy. After saving a number of them I found that I could trade one copy for two or three eggs.

"The picture shows a satisfied customer. Don't ask me what they do with them. The pages are too thick to roll good cigarets, and too slick for any other obvious use."

We also are at a loss to know what the Nyasalanders do with a slightly used copy of the Big Yellow Book, but we're pleased nonetheless. Our circulation manager is tickled at this evidence of the Journal's pass-along readership. And our editors are glad to know that at least one reader isn't concerned about the material being over his head.

Want an Oil Lease?

MAYBE you've seen advertisements in your local newspaper offering to get you an oil lease on 40 acres of government land for only $100 or maybe $200. The business must be pretty good, because several outfits are offering this service.

This illustrates three fundamental truths:

1. Most people still think an oil lease is a sure way to quick and easy riches.

2. Private enterprise is ever alert to serve human wants and bring supply and demand together.

3. Recent revelations in Washington have convinced the general public that it is necessary to employ a fixer to do business with the Government.

There is nothing really crooked about this business. Only gimmick is that everybody can get an oil lease on government land without the aid of a broker, and for only $30 for a 40-acre tract: $10 filing fee plus rental of 50 cents an acre for the first 3 years.

But if any of your friends is interested you might point out that an oil lease isn't oil; it's just a license to hunt for oil. And that it costs upwards of $500,000 to drill the first well in unproven territory. And that if the lease were in proven territory it couldn't be had for 50 cents an acre. And that an oil company won't drill in new territory unless it has leases on a block of several thousand acres. And that there are millions of acres of government land all through the West that oil companies have looked at but passed up as unpromising.

But if, after you have explained all that, your friend still insists on playing a long shot, he can get an oil lease by writing to the Interior Department without the services of one of those advertising brokers.

Incidentally, we recently saw an even better way to become an oil man in a hurry—an advertisement for a "package deal": Oil leases on 220 acres of undeveloped but promising land in New Mexico, a ranch-type house in Texas, and a fish-tail Cadillac, all for a single unit price.

—Henry D. Ralph

here's the plug

proved best by thousands of runs

Truth of the saying "Nothing succeeds like success" is outstandingly proved by the BAKER RETAINER BRIDGE PLUG! The "well proved" design—based upon the long famous Baker Cement Retainer—has performed successfully in countless thousands of wells—for every purpose—at all temperatures—and at all depths.

IDEAL FOR EVERY PURPOSE

For new well completions, work-overs, testing, squeeze jobs, well abandonments, and many other installations, you can be sure of fast, efficient, economical results with the Baker Model "K" Retainer Bridge Plug—Product No. 400.

The design of the plug affords ample clearance for fast, safe running-in, and the slips set quickly and positively. The packing element is held in sealing position by lead seals; packs off against all differential pressures; and prevents movement of fluid or gas either up or down the well. There is no need to place cement above the Baker Retainer Bridge Plug to effect a perfect seal, but, if desired, you can dump cement *on the same run* by using a Baker Model "B" Dump Bailer.

YOUR CHOICE OF TWO EASILY DRILLABLE TYPES

For temporary service, choose the Baker MAGNESIUM ALLOY Type Bridge Plug; for permanent installations, specify the CAST IRON Type which is stronger than the casing, and will outlast the casing if harmful well fluids are a problem. Either type drills up in record time because the drilling bit contacts the *very minimum* cross-sectional area; the *short over-all length* reduces drilling time; and the *segmented cast iron slips* are quickly broken up with cable tools, or a rotary bit.

CHOOSE YOUR SETTING METHOD

A BAKER BRIDGE PLUG (Product No. 400) can be set on tubing or drill pipe (in the same manner as the well known Baker Cement Retainer) but in these days of pipe shortages we suggest that you contact your choice of the leading wire line service organizations for setting a Baker Bridge Plug (Product No. 400-D) on an electrical conductor cable. You can thus avoid wear and tear on your tubing, and worthwhile savings of time result from wire line setting, particularly in deeper wells.

ARE YOU USING THE BAKER ADVISORY SERVICE?

Why not call the Baker representative in your area and discuss with him installation of a Baker Bridge Plug? You will find that he has valuable knowledge and helpful suggestions to solve your problems.

BAKER OIL TOOLS, INC.

HOUSTON • LOS ANGELES • NEW YORK

BAKER

RETAINER BRIDGE PLUG

In unitization we need a synonym for "compulsory"

THE oil industry wants unit operation of oil pools but it hates to be forced to it.

That is the consensus of a survey of representative opinion presented in this issue of the Journal. The comments were evoked by the recent action of the Supreme Court of the United States in upholding the validity of Oklahoma's compulsory unitization law.

It's the word "compulsion" that sticks in an oil man's craw. That is natural—and commendable. The Journal doesn't like the idea of compulsion, either. We are for free enterprise, individual initiative, private property rights, voluntary cooperation, and democratic principles.

BUT when it comes to unitization, the Journal favors the degree of compulsion embodied in the Oklahoma and Arkansas laws. The way compulsion is applied there does not do violence to our democratic traditions. Rather, it protects majority interests and benefits the public.

The experience of the race has shown that private rights may not be used to injure one's neighbor or the general public, that the views of a minority often must bow to the will of the majority, and that state police power is properly used to achieve these ends and to referee the disputes.

The experience of oil conservation has shown that the original rule of capture—unbridled free enterprise—has steadily been modified by spacing, proration, and other production regulations in order to promote the public welfare by conservation of a natural resource.

NOW it is universally accepted that unit operation will recover more oil from a pool in a majority of instances. A great many unit plans have been initiated and operated by voluntary agreements. But there are other cases where a small minority of ownership interests has blocked an equitable and well-engineered unit plan which would have produced more oil for all other operators and for the general public in the long run.

In such cases, the Journal believes, a degree of compulsion is desirable. The initiative, the detailed planning, and the operating should be in the hands of the majority of the private interests. But state police power should referee disputes, see that the minority gets equitable treatment, and protect the public interest in maximum production and conservation.

THIS is a middle ground between too-free private enterprise and too-arbitrary government control. It has been applied successfully in many cases. It promotes conservation.

The worst thing about it is that word "compulsory". Can't somebody think up a sweeter-sounding label that won't make us all bristle at its mention?

...the original cellophane SEAL FLAKES are the best plug for "thief formations"

SEAL FLAKES do the job faster; and better, in sealing off formations against loss of mud circulation. Easily pumped, mixes readily, completely inert, does not affect chemical properties of the drilling fluid, absorbs no water.

There is no lost circulation material like Cellophane — and there is no flake made and packaged to the same high standards set for SEAL FLAKES by the originator, BROOKS PAPER COMPANY.

When you meet a "thief formation" have this drilling insurance on hand — SEAL FLAKES retain their strength, do not ball up. You get a positive, lasting seal that restores circulation.

Consult your nearest mud company distributor

The compact, machine-pressed bales economize transportation charges, make storage simpler, handling easier. Brooks packages the finest product the best way. Brooks welcomes inquiries from drilling superintendents, mud engineers, drilling contractors, and mud service companies. SEAL FLAKES were originated and perfected, and are sold only by BROOKS PAPER COMPANY, St. Louis, Mo., oldest Cellophane converter in America.

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SECURITY BUILDING • ST. LOUIS, MO.

THIS WEEK

PRODUCTION. — Phillips announces its Pecos County tight wildcat is a gas well with a potential above 100 million cubic feet daily. . . . Three wells around the big discovery now being drilled. . . . Success opens big new area which has been little explored at depth. . . . ¶Amerada gets big oil well in an offset to discovery well in Moore-Devonian pool of New Mexico's Caprock area. . . . Well flows for 3 hours at a rate of 150 bbl. per hour. . . . ¶Richfield completes second well in new area of California's Wheeler Ridge field. . . . Well flows at rate of 1,114 bbl. daily through ¼-in. choke. . . .

SCRUB BRUSH AND DRY GRASS surround this Cities Service rig on the Nunn lease in Reagan County, Texas, typical of the more than 160 drillings now active in this spectacular trend which is now productive in six counties.

INTERNATIONAL.—Arabian American agrees with Saudi Arabian Government to split profits 50-50 before U. S. taxes, put two Saudi Arabs on board of directors. . . . Other major questions raised by government remain unsettled. . . . These include faster rate of returning concession acreage to government, including that on which oil has been discovered but is not being produced. . . . Another point is proposed change in method of pricing crude oil to give government bigger income. . . . ¶International Court winds up hearings on Iranian nationalization case with indications its decision will be handed down in mid-July. . . . ¶Chile begins operations in new pressure-maintenance and natural-gasoline plant in Tierra del Fuego area. . . . Completion will permit reopening of Manantiales field, closed because of increasing gas-oil ratios. . . .

GOVERNMENT.—High sources declare question of overriding Truman veto of tidelands bill will not reach a vote in the Senate. . . . Explanation given is that there aren't sufficient votes to convert the measure into law over Truman's veto. . . . ¶PAD tells the advisory committee on military fuels there won't be enough aviation gasoline for at least 5 years. . . . Expansion goals for TEL, benzene, and lube-oil additives production will be met, PAD advises. . . . ¶Disappearing steel supplies force PAD to quit issuing authorizations for buying casing and tubing from emergency stocks set aside for wildcatting. . . .

TRENDS.—Inventories of four major products increased 16,505,000 bbl. in the 3-week period ended June 21 compared with a gain of 10,963,000 bbl. in the same weeks last year. . . . Gasoline dropped only 548,000 bbl. this year against 2,622,000 bbl. last year. . . . Kerosine and distillate stocks gained 953,000 bbl. more than last year. . . . Residual stocks increased 2,515,000 bbl. more than in 1951. . . .

ACTIVITY.—Production of crude and lease condensate averaged 6,159,675 bbl. daily for week ended June 21, up 3,025 bbl. daily. . . . Total completions increased 6 wells to 937 for the week. . . . Wildcat completions totaled 183 compared with 225 for previous week and 198 for same week last year. . . . Total rotary rigs operating in United States on June 23 amounted to 2,787, the first report below 2,800 since the end of April. . . .

OUTLOOK.—President's Materials Policy Commission predicts oil consumption will reach 5 billion barrels in 1975, in a 140,000-word report on long-range materials problem and what to do about it. . . . ¶This is more than double consumption in 1950. . . . To meet this huge increase, the committee recommends that the U. S. encourage imports from any source available at little or no tariff, push private development of tidelands observing stringent conservation, and encourage perfection of techniques for economically producing synthetic liquid fuels. . . . ¶The commission underlines its conclusion that we are not running out of oil. . . . ¶It also defends depletion allowance as vital and as the best measure currently conceivable to induce industry to take the big risks involved in exploration. . . .

PIPE LINES.—FPC authorizes El Paso Natural Gas Co.'s proposed $108,680,000 expansion program to provide additional natural gas to New Mexico, Arizona, California, and Nevada. . . . ¶Tennessee Gas Transmission Co. given approval on $128,216,000 construction program to increase capacity of its system by 205,000,000 cu. ft. daily. . . . ¶United Gas Pipe Line Co. announces it expects to complete this year its expansion program involving about 1,000 miles of big-inch lines.

MANAGEMENT.—Warren Petroleum Corp. this week will liquidate five subsidiaries, placing the activities of four under existing departments of the parent company. . . . A fifth, Dri-Gas Corp., will have a separate department within Warren Petroleum. . . . ¶Monterey Oil Co. takes over properties of Jergins Oil Co. in California. . . . ¶Public must be told the oil industry is more than paying its way through taxes almost confiscatory, Esso Standard official tells Mid-Continent association tax forum. . . . Public support, he says, is essential to maintain our tradition of free enterprise. . . .

The Journal Asked the Industry:

Is Compulsory Unitization Needed?

. . . Answers vary, of course, but everyone is opposed to federal intervention of any type.

. . . Many operators favor state laws to require participation in units when a big majority of operators want it.

. . . But some prefer voluntary unitization, think laws to require it are a step toward government control.

Henry D. Ralph

THE proposition that most oil fields can be produced most efficiently when operated as a unit is now accepted by most of the American petroleum industry, but mention of "compulsory unitization" causes a majority of oil men to shudder in horror.

When the Supreme Court of the United States sustained Oklahoma's compulsory unitization law *(The Oil and Gas Journal, May 19, page 82)* the Journal asked representative leaders of industry opinion:

"What next? Should other states enact similar laws? Or should compulsory unitization be fought as undue government interference with individual property rights?"

Some said "yes"; some said "no"; some said "maybe."

But these differences of opinions on careful analysis, turn out to be more apparent than real. They are largely differences in degree.

That horrid word . . . The word "compulsion" is hard for an oil man to swallow. Another label with less stigma would greatly increase the general support for laws like that of Oklahoma.

It is amusing, but understandable, that a number of replies from prominent oil executives started out with a flat NO—no compulsion, no government interference. Then the writers praised unit operation, predicted its rapid spread, and deplored the fact that a small majority often blocks a voluntary agreement.

An, in almost every case, the letters wound up by saying that some way should be found to prevent a recalcitrant minority interest from blocking a unit plan proposed by a majority of the operators and when the plan will increase ultimate recovery and has been found reasonable and equitable by a state conservation body — which, of course, is exactly the pattern of Oklahoma's compulsory unitization law.

Federal? Never! . . . There is unanimous agreement on one point: Nobody wants the federal Government to have anything to do with unitization.

In spite of the wording of the Journal's query, several repliers apparently assumed that "compulsion" and "Washington" are synonymous. But some who strongly oppose any federal interference are willing to accept a unitization order from a state conservation agency under certain conditions.

Not one reply to the Journal opposed the principle of unit operation, though a couple pointed out that unitization is not an end in itself and should be attempted only where no other method will produce as much oil.

Voluntary?—Ideal! . . . But most oil men cling to the hope that unit operation can be achieved through voluntary agreements among all operators and royalty owners in a given pool. To this end they suggest more education, more persuasion, and state conservation regulations making it more attractive for an operator to join a unit plan than to stay out.

Only as a last resort would the typical oil man favor state laws compelling a minority of hold-out operators to join a unit plan when the evidence was clear that unitization would promote conservation and increase oil recovery.

Still, no one suggested repeal of the Oklahoma statute, nor of a very similar compulsory unitization law in Arkansas which has been upheld by the courts of that state.

It's nothing new . . . Compulsory unitization on a small scale—the drilling unit—is old and common in the oil industry. The states of Alabama, Arkansas, Colorado, Georgia, Florida, Indiana, Louisiana, Michigan, Mississippi, New Mexico, Oklahoma, and Wyoming all have laws providing for the compulsory pooling and unitized operation of separately owned tracts within drilling or spacing units—areas usually embracing from 10 to 40 or 80 acres each.

Pool-wide unitization is no different in the eyes of the law. In either case the surface owner may not be permitted to withdraw the oil under his land when and how he sees fit but must be content with a pro rata share of the production from a well on adjacent property.

In some states, notably Louisiana and Alabama, the conservation commission has power, on its own motion, to order pool-wide unit operation of a condensate field where necessary to carry on cycling operations.

Not much compulsion . . . The Oklahoma and Arkansas statutes are not confined to condensate fields, but they do not permit the conservation authorities to initiate action. A plan for unit operation must be proposed and worked out in detail by a majority of the operators in the pool (63 per cent in Oklahoma, 75 per cent in Arkansas).

A public hearing is held by the commission at which all interested parties may enter protests. Then, if the commission finds that the plan is reasonable, will aid conservation, and protects the equities of all parties as nearly as is practical, it can order the plan into effect. So the compulsion is against those producers and royalty owners who refuse to cooperate with the majority in a soundly engineered plan to produce more oil during the life of the field.

Some say yes . . . Some oil executives give unqualified support to compulsory pooling. The president of one very large company wrote:

"As a major producer we, of course, are sold on the theory of unitization in all cases where unit operations will result in conservation or greater recoveries. It follows that we favor state laws which expedite or ease the accomplishment of unitization in such cases."

The head of a large independent company wrote:

"The best-laid plans for unitization

may be frustrated because of the impossibility of obtaining the commitment of small tracts within the unitized area. The enactment of compulsory unitization laws similar to the Oklahoma act would be beneficial to the operators and land owners in every state in which oil and gas are produced."

Protects rights . . . The president of a producing subsidiary of a major integrated company wrote:

"Although voluntary unitization is desirable, experience has shown that often a very small minority can effectively interfere with a unitization effort. The result is to deprive other property owners in the pool of substantial property rights.

"To cope with this situation effectively, some kind of compulsory unitization legislation is essential. Any such legislation should leave to a majority of the operators and mineral owners the duty and responsibility of agreeing among themselves on the plan and program of unitization before resort is had to compulsion.

"Compulsory unitization, with the operators and mineral owners determining the program to be followed, does not represent undue government interference with individual property rights; but rather does it make possible the proper protection of the property rights of all."

Too harsh a word . . . Here's another reply in the same vein, from the head of a large producing company:

"Should other states enact similar laws? Yes, they should enact similar or even improved laws as experience shows the way. Unitization should not be fought but should be encouraged as protection of individual property rights. Preferably it should be voluntary or under state regulation only, rather than through the national government, however.

"And is unitization 'compulsory' under any state statute even today? When it takes a vast majority to initiate or execute a unitization hearing, and when a minority may block or void final unitization, can it be said that such unitization was compulsory? If we accept the principle of majority consensus for the general good, the word 'compulsory' seems too harsh and restrictive."

Guarded endorsement . . . A similarly guarded endorsement—which amounts to approval of laws now in effect—is this from the president of a very large major producer:

"Unitization of the entirety of the common source, generally referred to as field-wide unitization, is designed to accomplish the primary objectives of conservative laws. Waste is prevented by conducting the operation in such a manner as to obtain the greatest ultimate recovery of oil and gas. Protection of correlative rights of the owners in a common pool is accomplished by allocation of the total production to the separately owned tracts comprising the unit area in accordance with a formula that considers the relative mineral values of the tracts and to the unit operation.

"We favor field-wide unitization as a voluntary procedure (as under the laws of Texas), but prefer a compulsory procedure (as under the laws of Arkansas and Oklahoma) when it clearly appears from the geological and engineering data developed from reservoir studies that that type of operation will prevent waste, will result in obtaining the greatest ultimate recovery of oil and gas from the common pool, and will insure to each owner the opportunity to receive his fair and equitable share of the pool production.

"We believe that a small minority of either working-interest or royalty-interest owners in the common pool should not be able to prevent field-wide unitization. Consequently, we do not favor at this time compulsory unitization only on motion of the regulatory body or at the instance of a small minority of the working-interest and royalty-interest owners.

"It is true that laws requiring unitiza-

A Typical Answer to the Journal's Inquiry

CITIES SERVICE COMPANY
Incorporated
Sixty Wall Tower, New York, N. Y.

Mr. C. O. Willson, Editor
The Oil and Gas Journal
Tulsa, Oklahoma

June 4, 1952

Dear Mr. Willson:

This is in reply to your letter of May 22 concerning the recent Supreme Court decision upholding the constitutionality of Oklahoma's unitization law. The decision comes almost thirty years after Henry L. Doherty, founder of Cities Service Company, first began to champion the unit operation of oil pools as a necessary measure to increase ultimate production and promote conservation. His early recognition of the values of unitization and his pioneering in that field in the face of obstinate and sometimes bitter opposition by his colleagues must be classified as a major contribution in the development of the petroleum industry. Were he alive today, I am sure he would feel a deep sense of satisfaction over the court's decision.

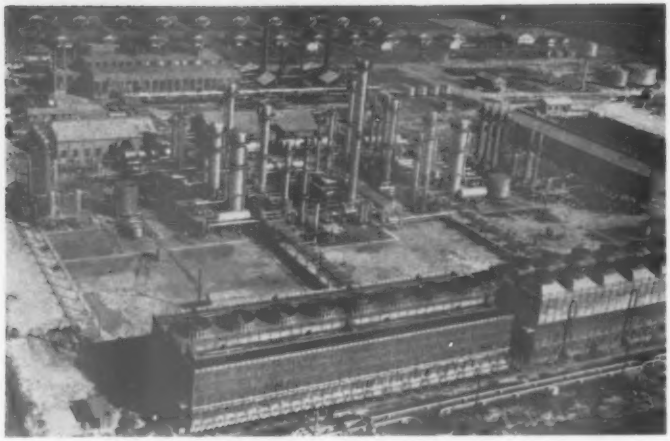
There can no longer be any doubt from a scientific standpoint that unit operation of many fields may be required for maximum recovery. In such cases it is essential to have machinery under which recalcitrant minority interests may be brought into line. Such machinery can best be provided through state conservation laws comparable to the Oklahoma statute.

Almost all laws interfere somewhat either directly or indirectly with individual rights. Where such laws are essential to promote the common welfare, individual rights must yield to the extent necessary. Such is true in the case of our laws relating to eminent domain and military conscription. It is no less true with respect to the conservation of petroleum which is perhaps our most essential natural resource in this day of mechanized warfare and motorized living. Reasonable state unitization laws to effectuate scientifically proved methods of conservation are almost indispensable if we are to realize maximum benefits from petroleum production.

Caution must be used, however, to legislate in a manner that will not further the general trend toward political control and regulation of industry. The prerogative of initiating and developing unitization plans should always remain with the owners rather than being vested in some state agency or department. Compulsion will thus be limited to carrying out the will of a majority in ownership.

Sincerely,

W. ALTON JONES,
President.



UNIT OPERATION of an entire field makes possible gas-cycling projects like this huge plant in Katy field, near Houston.

tion of oil and gas pools interfere with property rights. That is likewise true with respect to general conservation laws authorizing the various regulatory bodies to space wells and to regulate the production from the wells. However, with proper safeguards on the unrestricted exercise of authority, it is our view that compulsory unitization and other conservation laws are necessary and do not constitute an unreasonable interference with individual property rights."

"No . . . but" . . . The shudder caused by mention of the word "compulsory" is typified in two replies from the heads of quite large integrated companies. Both start out saying "no" and end up saying "yes." One wrote:

"On the question of whether states should adopt compulsory unitization laws, the immediate reaction is NO, for the reason that, as rugged individualists, it goes against the grain to have to say 'there ought to be a law.'

"But the facts of life being what they are, a fair appraisal of the situation leads us to the conclusion that only by such a law can unitization be accomplished in those fields where there is wide diversity of ownership.

"Any compulsory unitization law should, of course, provide specific standards for guidance and limits of control by governmental agencies, to the end that justice may be done to all interested parties."

As a last resort . . . The other executive phrased it this way:

"The industry's experience indicates that maximum efficiency can only be obtained with unitization. The industry has also learned that it is sometimes impossible to achieve unitization by voluntary action.

"Despite the differences of opinion which at times prevent the unitization, there has been a wide swing toward cooperative or voluntary unitization. This has stemmed from the realization of the value of unitization and thus it has been possible for many units to be formed.

"The evolution of thinking with respect to cooperative unitization and compulsory unitization should be permitted to run its course in a democratic or normal way rather than to resort to a sudden swing to compulsory unitization.

"Laws should be enacted, if it is the will of the people, that will encourage unitization. Such laws would protect the property rights of all owners of a common source of hydrocarbons and should result in greater ultimate gain to the consuming public. This should come about through the dissemination of information and education of the oil operators and the royalty owners.

"Such legislation should be encouraged by the oil industry, and only where it appears that a substantial majority of those interested favor unitization there should be procedures, legal if necessary, to effectuate full unitization, protecting at all times the separate interest of those concerned and provided unitization is in the interests of the public."

Independents oppose . . . Spokesmen for associations of independent producers don't hesitate to oppose compulsory unitization. They are for unit operation, but they want it voluntary. One wrote:

"Permissive legislation authorizing voluntary unitization has worked rather well. The general feeling among producers is that voluntary unitization is workable and will become more practiced as the merits of unitization become more widely known and appreciated.

"Certainly any law that can be made to work, through education, on a voluntary basis, is far superior to one based on compulsion."

Collectivist Utopia . . . The second association president put it more strongly:

"If our aim is to reach a technological Utopia in the production of oil, compulsory unitization is a definite step in that direction. However, compulsory unitization by government fiat is also a direct application of the philosophy of collectivism.

"Under our system of free enterprise, of which the oil industry proudly proclaims itself as a champion, some middle course has to be reached between complete conservation and virtual confiscation of property rights.

"It is true that it takes time, money, and effort to complete unitization of many fields, but they represent a shining example of business cooperation under free enterprise principles in which we take such pride.

"A law would make this procedure easier and cheaper, but would represent just one more triumph for the socialistic planners and eventually would act as a boomerang to its advocates within the industry."

In summary . . . Many more replies were received by the Journal, but those quoted are representative. The views expressed in other letters may be summarized thus:

. . . The industry is in complete agreement that unit operation of a pool can, in most cases, promote conservation and achieve greatest production.

. . . Education to foster voluntary cooperation in unitization is highly desirable.

. . . Every unit operation must meet these standards: Greater ultimate recovery (not just operating economy), initiation and operation by a majority of the ownership interests, protection of minority interests, equitable allocation of participation and benefits, a showing of public benefit.

. . . Where a small minority blocks a unitization plan meeting all agreed standards, at least half of the oil industry will, perhaps with some reluctance, accept compulsory legislation.

. . . Compulsory legislation should be administered by state conservation agencies as referees only.

Oil's Outlook for '75

To meet doubled demand, U.S. must encourage imports, push conservation and tidelands program commission finds

Bertram F. Linz

WASHINGTON.—United States petroleum consumption in 1975 will be in the neighborhood of 5,000,000,000 bbl.—more than double the 1950 consumption of 2,375,000,000 bbl., the President's Materials Policy Commission . :ecast last week.

The commission's projections were made in a 140,000-word report on the long-range materials problem and what to do about it.

Its study went deeply into the outlook for petroleum, which it admitted is "the great enigma of future energy supplies."

The nation is not running out of oil, the commission emphasized. But to meet the demands of 1975 it will be necessary to encourage the importation of oil from any source available, at the lowest possible tariff or no tariff; to push private development of the oil resources of the Continental Shelf under conditions of extreme conservation, and to encourage the perfection of techniques for the economic production of synthetic liquid fuels.

Demand in '75... The commission's estimate of a 110 per cent increase in consumption over the quarter-century indicated that the greatest increase in demand will be for kerosine and distillates, 130 per cent from 1950's 513,000,000 bbl. to 1,180,000,000 bbl. Motor-fuel consumption will increase 110 per cent, from 994,000,000 to 2,085,000,000 bbl., and 100 per cent increases are foreseen for residual oil, 554,000,000 to 1,110,000,000 bbl.; lubricants, 39,000,000 to 75,000,000 bbl., and other products, 275,000,000 to 550,000,000 bbl.

The report discussed and dismissed the many predictions in the past that our oil supply was doomed to exhaustion in any fixed number of years but pointed out logically that "no matter how large the nation's petroleum resources ultimately prove to be, one fact is now clear: Eventually the resources will dwindle and become progressively inadequate."

Already, the report commented, the first warning signal of this eventually has appeared—within the last 5 years domestic demand for crude has begun to outstrip domestic production.

On the basis of its study, the commission reached the following conclusions regarding the long-range petroleum outlook:

...Discoveries of oil in this country will not stop abruptly, nor will reserves become exhausted suddenly and without notice.

...Domestic crude production can be counted on for a long time to supply a sizable portion of liquid-fuel demand, even though it is debatable whether the 1975 level of production will be lower or higher than now.

...Imports of crude oil and refined products by 1975 probably will be greater than now, regardless of the level of domestic production then.

...Synthetic oil, probably first from shale and later from coal, will come into commercial production within a decade or so, perhaps sooner.

"What appears fairly certain, then, is that the nation's liquid-fuel supplies by 1975 will come from three main sources: Domestic crude, imports, and synthetic oil," the commission said.

"The question that cannot now be answered is: What part of the total liquid fuels will each of these three sources supply to the nation in 1975? The answer will be fashioned largely by the behavior of relative costs of domestic crude, imports, and synthetics—provided competitive market forces are allowed reasonably free rein."

Domestic prices of crude undoubtedly could be expected to rise considerably as a result of the rising pressures on cost exerted by the increase in drilling depth and in the ratio of dry holes, except for the existence of competitive sources of liquid fuels, the study showed.

No soaring price... "These highly expansible competitive sources of liquid fuel (foreign crudes and synthetics) can be expected to keep the price of domestic crude from rising more than 25 to 30 per cent (relative to the nation's general price level) over the next 25 years, and the rise may be far less," the report warned. "Thus, only that crude petroleum which can be discovered and produced in the United States within these economic limits will enter the energy stream.

"Domestic crude production is still far from the end of the road, but even under fairly optimistic assumptions it probably cannot keep pace with rising domestic needs up to 1975."

Production will expand much more

Invited to the International Petroleum Exposition

Oscar B. Irizarry, left, presents official invitations to two prominent Venezuelans in Washington to attend the International Petroleum Exposition in Tulsa May 14-23 next year. The invitations, presented on behalf of Johnston Murray, governor of Oklahoma, and William G. Skelly, I.P.E. president, were given Dr. Aureliano Otanez, center, minister counsellor and charge d' affaires of Venezuela, and Dr. Carlos Perez de la Cova, right, minister counsellor in charge of petroleum. Irizarry is editor of Petroleo Interamericano, Latin American oil publication affiliated with The Oil and Gas Journal. During his Washington trip, Irizarry extended official invitations to representatives of 47 foreign governments.

rapidly abroad over the next quarter century, the commission believes, though there are factors which put definite limits on the rate of such expansion—such as lack in the near future of steel for tankers, pipe lines, and drilling, and of competent managers and labor trained in all the specialized skills required in all phases of oil operations.

In addition, liquid fuels already present a serious security problem to the whole free world, and this problem is likely to increase. If war should come, whether next year or 25 years hence, the liquid-fuel needs of both the United States and its allies would rise abruptly.

The loss of any source of supply, particularly in the Middle East, would throw almost the full burden upon Western Hemisphere resources. Western Europe's dependence on Middle Eastern oil is expected to increase in the years ahead, and the United States may rely to a greater extent on imports from vulnerable areas. The security problem obviously will increase with the passage of years, the commission believes.

Imports encouraged . . . But, it was commented in the report, "the commission believes that present knowledge of this nation's future oil position does not warrant discrimination against imports of crude oil from any quarter of the world.

"Every encouragement should be given, within limits of economic reasonableness, to establishing greater oil reserves and production capacity in relatively safe areas, particularly in the Western Hemisphere, but not by placing penalties on oil production elsewhere.

"In view of its future needs and limited resources, this nation should welcome crude-oil imports, not place obstacles in their way. Tariffs on crude-oil imports should therefore be held down, reduced, or eliminated, within the limits imposed by national security considerations."

The commission held that private business can be counted on to bring about the bulk of adjustments necessary to accommodate the country to the developments which it sees ahead, "at an appropriate pace if no uneconomic impediments to domestic crude-oil exploration and production are allowed to develop, if imports are permitted to flow freely in whatever amount the price situation dictates, and if synthetic production is not discouraged by shortages of capital, monopolistic restraints, or the like."

Depletion allowance . . . Percentage depletion, the commission said, definitely should be retained "because of its strong inducement to risk capital to enter the mineral industries," but it added that current rates should be raised no further.

"Exploration and development costs should be fully expensible for tax purposes because of the direct incentive this arrangement gives for capital to take risks in highly uncertain fields. Such expensing is particularly important for the petroleum industry whose annual exploration and development costs are measured in billions of dollars."

Percentage depletion is not without its limitations, the commission said, but no alternative method of taxation has been suggested to, or could be devised by, the group which would overcome these limitations and still achieve the desired results.

Tidelands stockpile . . . Evaluating the situation that would develop in the event of war, the commission pointed out that rationing to civilians would not offset the loss of oil cut off by enemy action and that there can be no conventional stockpile of oil to fall back on.

"What obviously would help most in time of war would be to have an 'underground stockpile' of semiproved oil deposits which could be drilled up as required with maximum speed and at minimum expenditure of materials and manpower on dry holes," the report suggested.

"A large area which lends itself to such treatment is presently the property of the United States Government—the Continental Shelf, particularly that section off the Gulf Coast. Geologists are agreed that prospects for finding large pools of oil in this offshore area are excellent. But there still remain the difficult and expensive technical problems of exploring and producing 'underwater oil.'

"The private oil industry can solve these technical problems if given access to the Continental Shelf. Government leases permitting private oil exploration and development can provide such access and incentive. The nation can help to establish a security reserve of crude oil if leases are so written as to require wide spacing of wells or limited withdrawals, or both, and by setting royalty provisions which allow for adequate financial incentive. By allowing fewer producing wells than would be worked in normal practice, or keeping withdrawals below the usual rate, or a combination of both measures, the life of offshore pools might be considerably prolonged.

Also, it suggested, it would be desirable for the United States to encourage by any reasonable means the enlargement of crude reserves elsewhere in the Western Hemisphere.

Synthetic fuels . . . With respect to synthetic fuels, the commission recommended that the federal Government give limited financial assistance to any qualified private companies that will undertake the production of oil from shale "in order to encourage as soon as possible the construction of small-scale commercial plants and thus accelerate the gaining of technical knowledge necessary for later economical expansion."

For the present one promising form of such assistance is for the Government to absorb a sufficient portion of the transportation costs from plant to market to give synthetics producers a competitive position with crude petroleum products in those markets.

Finally, it said, the National Security Resources Board, with the aid of the Interior Department, should undertake a continuing study of the economic aspects of producing synthetic liquid fuels from shale and coal in relation to security needs and the outlook for future petroleum supplies.

No Tidelands Vote Expected

WASHINGTON. — Advocates of state ownership of the tidelands will probably drop all plans to attempt to have the Senate override President Truman's veto of the legislation.

This was decided, it was explained by a high-placed source, when it was found that supporters of the bill simply did not have the votes to override the veto.

The possibility that the situation might change if Congress returns to Washington after the political conventions was not ruled out. However, as the matter stands now, a tally of the probable vote in the Senate indicates that the veto would stand.

The decision to drop the matter for the present was influenced by assurances given by Interior Secretary Oscar L. Chapman that he will not try to assert federal management of the tidelands under any existing law, but will wait until Congress acts.

Exports Decline Further

WASHINGTON. — Total exports of major petroleum products averaged 164,000 bbl. daily for the week ended May 30 for a decrease of 25,300 bbl. daily from previous week, according to figures compiled by the Petroleum Administration for Defense.

The total for the week was at the lowest level since April 25. The only important increase over the preceding week was reported for residual fuel, up 25,500 bbl. daily.

Daily average shipments for the week, compared with the week ended May 23

and the average for the 4 weeks ended May 30, in thousands of barrels, are shown in the accompanying table.

	Week ended May 30	Week ended May 23	Average 4 weeks
Aviation gasoline	4.2	.	7.1
Motor gasoline	16.7	13.0	14.8
Kerosine		19.9	26.6
Distillate	63.8	102.6	77.2
Residual	79.3	53.8	65.9
Total	164.0	189.3	191.6

No 40-Acre Leases

New public-lands policy sets minimum of 640 acres

WASHINGTON. — The Interior Department has abandoned its policy of issuing 40-acre oil and gas leases on the public lands.

Under new regulations just adopted, the Bureau of Land Management, normally, will not accept applications for less than 640 acres.

Applications for leases of smaller tracts, however, will be considered where it can be shown that the lands are in an approved unit or cooperative plan, or a unit approved as to form, or where the tract to be leased is isolated by land not subject to lease.

The new regulations were written to end a wave of speculative leasing resulting from the publicity given a drawing last November for leases on the New Mexico potash reserve. The majority of applications were filed on behalf of individuals by companies charging fees considerably in excess of the $30 asked by the Government, and the land offices were directed June 11 to cease processing 40-acre lease offers.

To discourage the practice of companies taking large leases and relinquishing small isolated tracts for releasing, no offers will be accepted in such cases for 60 days after relinquishments are filed.

More Casing, Tubing Urged

WASHINGTON.—A ready market by 1955 for 4,000,000 tons of oil country tubular goods a year was outlined to oil-country pipe manufacturers last week by Petroleum Administration for Defense.

The meeting was called by Deputy Administrator J. Ed Warren to show manufacturers they should expand production facilities to meet the expanding needs of the oil industry.

Warren said the approved program for drilling 25,000 wells during the last half of this year and 55,000 in 1953 probably will be inadequate. It will be necessary, he said, to drill 60,000 wells in 1954 and 65,000 the following year.

Outlining the market for tubular goods, PAD officials said that not only will the number of wells drilled annually increase by 5,000 a year through 1955 but the average well depth, this year 3,971 ft., is increasing at the rate of 100 ft. a year.

"We must start now if we are to meet even the foreseeable demands for pipe," Warren said, "and we must remember that all the estimates are based, not on any assumption of the possibility of all-out war, but on the assumption of a continuance of no more than present mobilization needs."

Avgas Still Short

Review of refining goals given fuels-advisory group

WASHINGTON.—Despite the development of jet-propelled aircraft, it will be 5 years "at least" before production capacity for aviation gasoline will catch up with projected requirements.

This is what PAD officials told the military-fuels general advisory committee at an all-day executive meeting June 24.

The TEL expansion program was reported in good shape. One new plant began operations this spring. Another will begin operating this fall. Before the end of this calendar year, it was reported, production capacity will exceed requirements.

There still is room for additional projects in the program for expanding basic refining capacity, PAD advised the committee. Contracts now signed do not provide a sufficient amount of capacity, the agency said.

Other work . . . Goal of the benzene production capacity expansion program is 131 million gallons a year. That is subscribed to. Sufficient projects are signed or in the works to meet this goal.

The same is true of the program for expanding output of detergent-type lube-oil additives. The goal, which will be met, is 10 million pounds of additional production capacity per month.

PAD's goal for expanded sulfur production capacity to come from petroleum industry plants is 500,000 tons a year. Projects approved or in the works will take care of 85 per cent of this goal.

Disappointing progress was reported with respect to a lesser product-expansion program, that for high-viscosity-index lube oil. The goal is 28,000 bbl. a day, and PAD doesn't have it in sight.

Plant Site Picked

Williston basin refinery planned for Mandan, N. D.

MANDAN, N. D. — The Williston basin refinery planned by Standard Oil Co. (Ind.) may be built at Mandan, across the Missouri River from Bismarck.

The company last week announced it has taken options on 900 acres as a site for its planned 15,000-bbl. refinery. The company said test crews this week will begin making soil tests and other investigations.

The refinery will be so designed that it can be expanded to a minimum of 30,000 bbl. daily, S. A. Montgomery, general manager of manufacturing, said.

"If the crude situation in the Williston basin develops as anticipated, construction should begin early in 1953 and initial operation will be scheduled about the middle of 1954," Montgomery added.

The refinery will include facilities for crude-oil distillation, catalytic cracking, vapor recovery, finishing, and shipping, the company said. The most modern type of equipment will be incorporated, the announcement added.

Indiana Standard now operates refineries at Whiting, Ind.; Wood River, Ill.; Sugar Creek, Mo.; Casper, Wyo.; and Neodesha, Kans.

ROCKY MOUNTAIN

Nevada Test Abandoned

SALT LAKE CITY.—The deepest test ever drilled in Nevada has been abandoned at 11,543 ft.

The wildcat was a joint venture of Continental Oil Co. and Standard Oil Co. of California in the Summit Spring area of White Pine County. It was the third test drilled by the combine in the northeastern part of the state. No further drilling is planned at this time by the two companies.

Their latest test was 1 Summit Spring Unit in 32-20n-60e, drilled from an elevation of 7,260 ft. Their two earlier wildcats were 1 Meridian Unit in the Pancake Summit area, dry at 10,314 ft., and 1 Hayden Creek Unit, abandoned a year ago at 5,117 ft. All three tests encountered minor oil shows.

The rig used in these joint tests, a contract rig of Coastal Drilling Co., is being moved near Currie in southeastern Elko County, where it will be used by Gulf Oil Corp. for drilling a deep test.

Alberta Gas Eyed

Westcoast official forecasts future California shipments after talks with P. G. & E.; FPC will rule on line this fall

CALGARY, Alta. — California may be importing natural gas from Canada within 5 years.

George McMahon, vice president of Westcoast Transmission Co., Ltd., which has permission of Canadian authorities to lay a gas line from Peace River gas fields in northern Alberta to Vancouver, B. C., and on to Portland, Ore., said his firm already has discussed with Pacific Gas & Electric Co., San Francisco, possible future deliveries of Alberta gas to the northern border of California.

Only a few blocks to Westcoast's proposed line remain. Although both Alberta and Canadian governments have approved the granting of an expor permit *(The Oil and Gas Journal, June 23, page 46)*, the company still must stand Canadian inspection as to its financial responsibility for the $110,000,000 project and Canadian Government determination of the sufficiency of reserves for export.

On this side of the border, Westcoast must secure a presidential permit to import the gas, as well as a permit from the Federal Power Commission to extend the line into the United States.

Following last week's hearings before FPC, it is expected that final decision on approving the line will be put off until autumn. In the meantime commission engineers will be sent to western Canada to verify Westcoast's figures on gas available for export.

Texas gas opposed . . . Westcoast will oppose any effort to serve the northwestern area of the United States with gas from Texas, McMahon said. This has been proposed by Pacific Northwest Pipe Line Corp., Houston. Any such proposal will be fought by Westcoast on the grounds that California alone needs more gas than is available or in prospect from the Texas-New Mexico area, he said.

Westcoast thinks it can deliver gas to Vancouver at a cost to consumers of 35 cents per M.c.f. and to cities in Washington and Oregon at comparable rates. Gas from Texas cannot possibly compete, McMahon said, because of the much longer pipe line required—an estimated 2,500 miles from Texas or other southern fields against 1,000 miles from Alberta.

McMahon referred indirectly to Seattle Gas Co.'s firm letter of intent issued 2 weeks ago to buy gas from Pacific Northwest *(The Oil and Gas Journal, June 23, page 46)* when he said the Westcoast project would be feasible, even if Seattle decides against signing up for Canadian gas, in view of growing demands in Oregon and California.

Westcoast hopes that the remaining necessary government permits will be issued in time for construction of the 984-mile line to start early next year. It then could be completed late in 1953, the company said. Some assurance has been held out that the project will get the necessary steel and other materials as a defense job approved by the joint defense board of both countries.

Westcoast is owned by Pacific Petroleums, Ltd., Hudson's Bay Co., Union Oil Co. of California, Peace River Natural Gas Co., and Canadian Atlantic Co.

If government clearances are refused, McMahon said, the owning companies will concentrate on developing oil instead of gas in the Peace River area. Considerable backing for the company's application, however, is looked for from California and other areas now being served with Texas and New Mexico gas.

FPC hearing . . . In Washington, several companies seeking to serve the same general area were in immediate danger of being dropped from the list of applicants.

A motion was filed to dismiss the application of Northwest Natural Gas Co., after a counsel for Northwest said he had no testimony to offer showing that the company has been authorized to export gas from Canada.

Normal FPC procedure allows opponents 10 days to file an answer to a motion after that motion has been submitted in writing.

Westcoast's counsel, Charles Shannon, said he would oppose any attempt by Pacific Northwest Pipe Line to offer testimony on its new proposal to pipe gas to the area from fields in Texas, Colorado, and New Mexico, instead of Alberta.

The latter firm has abandoned plans to import gas from Canada and said it would file an amended proposal within 60 days. Shannon said, however, that Pacific Northwest had nothing before the commission to amend, inasmuch as it is not prepared now to go ahead with testimony.

Henry F. Holland, representing Tennessee Gas Transmission Co. and Niagara Gas Transmission, Ltd., said he will ask that these firms' joint application be dropped from the hearing. Niagara would have purchased gas in southern Louisiana which Tennessee would have carried to the Canadian company at the international boundary for export and sale in Ontario and Quebec.

Management Shift

Monterey assumes control of Jergins oil properties

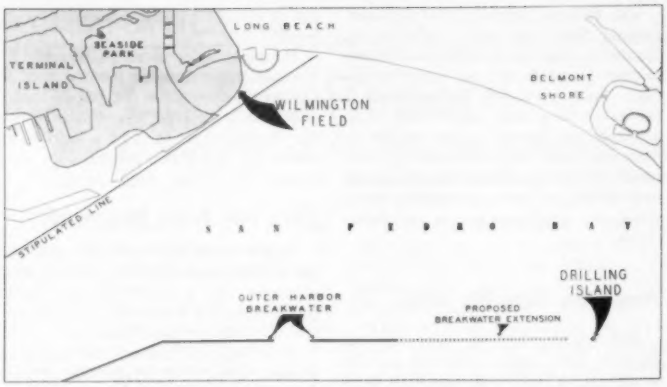
LOS ANGELES.—Oil properties of Jergins Oil Co., a leading California independent for 30 years, have been taken over by its operating successor, Monterey Oil Co. Wilmington Associates, Inc., jointly owns these properties but is not active in their management.

Lowell Stanley, Monterey board chairman, said no change in management or personnel was involved. Other Monterey officers include Howard C. Pyle, president, and E. E. Pyles, J. H. Abramson, and C. R. Pickering, vice presidents.

Current California production of Monterey is about 8,000 bbl. daily, of which about 7,000 bbl. is in Edison field, near Bakersfield. In addition its subsidiary, Monterey Oil Co. of Texas, produces about 1,000 bbl. daily in Texas and Oklahoma.

The company's California production was reduced some 11,500 bbl. daily through the recent sale of San Ardo properties, in which Jergins held a one-half interest, to General Petroleum Corp. That the concern was not going out of business, however, was emphasized by Stanley in stating that an expanded exploration and drilling program is scheduled. Negotiations also are under way for the purchase of additional producing properties in California and Texas, he said.

Executive offices of Monterey are being moved from Long Beach to the new Statler Building in Los Angeles about July 1.



Island Drilling Delayed

Strike puts off work on island off Seal Beach from which Monterey will drill a test on 1,400-acre underwater lease

D. H. Stormont

LOS ANGELES. — A construction-worker strike is delaying start of the $1,000,000 filled island from which Monterey Oil Co. will drill an exploratory well more than 1½ miles offshore from Seal Beach.

It is thought, however, that work will be completed on the 75-ft. diameter island by October 1.

The island, the first such structure in California waters, is to be built about 1,400 ft. east of a proposed extension to the outer harbor breakwater (see map). There the company jointly with The Texas Co. holds a lease in excess of 1,400 acres. Should the lease prove commercially productive, Monterey contemplates enlarging the fill to provide additional drill sites.

Constructed in 42 ft. of water, the steel-shelled structure will rise about 25 ft. above mean low-tide level. It will be filled with sand and capped with concrete. The structure will be capable of supporting loads anticipated in drilling to basement at 6,000 or 6,500 ft.

Earlier test . . . Some 30 bbl. daily already is being produced from the lease by a 12,000-ft. hole slanted from an upland location near Seal Beach.

The pay is correlated with the Terminal zone of Wilmington field about 5 miles northeast. Because of the angle at which the well was drilled it is not known whether Wilmington's upper pays, such as the Tar and Ranger zones, will be productive at the Monterey lease.

This earlier well, drilled in 1947, is believed to be the longest almost-horizontal well yet drilled. In drilling to a vertical depth of 5,400 ft. the 12,000-ft. hole made a horizontal displacement of 9,300 ft., with the deviation from vertical at times reaching 80°. Because of the hole's flatness, electric logging instruments had to be run in on the drill pipe.

Monterey's predecessor, Jergins Oil Co., drilled this test and two others shortly after World War II. In 1947, prior to the Supreme Court decision which held the Government had paramount interests in submerged lands, Jergins applied for permission to construct the island to further test the lease.

At the request of the Department of Interior, approval was withheld at that time by the Department of Army, which exercises control over navigation in coastal and inland waters. Earlier this year permission was obtained from these two departments and the Department of Justice, as well as that of state authorities.

Richfield Gets Good Well

BAKERSFIELD, Calif. — Richfield Oil Corp. has completed a second well in its recently opened area of Wheeler Ridge field, 25 miles south of here in Kern County.

The well, 76-26 KCL, flowed 44°-gravity oil at a rate of 1,114 bbl. daily through a ¼-in. choke. Production is from a Miocene interval. The discovery well of the new section of Wheeler Ridge field was completed about 2 months ago in the Eocene at 9,600-9,750 ft.

SOUTHWEST

Wildcat Strike

West Texas tight hole is big gasser, opens new area

MIDLAND. — Phillips Petroleum Co.'s deep West Texas wildcat, the important 1 Glenna, is an Ellenburger gas discovery with a potential in excess of 100,000,000 cu. ft. per day.

Phillips gave out the first information on the Pecos County tight hole last week and announced it is now drilling three more deep wells on the Glenna block, a spread of 23,000 acres in which Phillips has full interest.

Importance of the wildcat is in the fact that it is 25 miles from the nearest Ellenburger production and opens up a big, new area which has been relatively unexplored at depth.

Phillips drilled the 1 Glenna to 15,522 ft., penetrating 917 ft. of the Ellenburger dolomite before drilling was halted by mechanical difficulties. The company said the entire 598-ft. section from 13,924 to present depth is gas-producing. A tighter gas zone was found up the hole, and Phillips said it is expected that "several hundred feet" more of the productive lower zone will be found when the well is drilled deeper.

Three intervals have been tested to date, the company said, and two more will be tested.

Deepest in Texas . . . In addition to the Glenna block, Phillips has several other lease blocks in the area totaling more than 200,000 acres. The 1 Glenna is located about 25 miles southeast of Fort Stockton and is roughly in the center of the 23,000-acre Phillips block. It was spudded about 16 months ago.

Nearest Ellenburger production is in Wentz field, to the northeast, where two Gulf Oil Corp. wells produce oil from about 4,400 ft.

When completed, the 1 Glenna will be Texas' deepest producer of oil or gas. Present depth record is held by Magnolia Petroleum Co.'s 1 University in northeastern Andrews County, which was completed as an oil producer in the Ellenburger at 13,840-84 ft.

Geologically, Phillips' strike is in the Sheffield Channel, a seaway or connection between the Midland and Delaware basins that existed during Permian and pre-Permian time.

It is generally agreed that sediments in the channel should correspond, at least in age, to those found in the basins.

Spraberry Twist

Phillips asks permission to produce oil through casing

AUSTIN. — Permission to produce Spraberry wells through casing was asked of the Texas Railroad Commission last week by Phillips Petroleum Co.

Two Phillips engineers, O. P. Nicola and C. M. Langford, told the commission their company soon will have 10 wells completed for which tubing cannot be obtained. They have found, they said, that some wells in the area will flow through 7-in. casing.

The Phillips proposal would affect 10 fields—Germania, Tex Harvey, Midkiff, Driver, North Pembrook, Aldwell, Pembrook, Waddell, Benedum, and Flat Rock.

Immediate opposition to the plan was registered by Honolulu Oil Corp., Shell Oil Co., and The Texas Co. Texaco asked that if any exceptions to the tubing requirement are made that they be made on an individual-well basis after a hearing.

Tex Harvey Oil Co. did not oppose the plan, and Magnolia Petroleum Co. indicated no protest but suggested that permission to produce oil through the casing be granted for no longer than 3 months.

The Phillips engineers told the commission there are many wells in the Spraberry area which will flow through casing—probably for an extended period. Such operation would result in no waste, they said, since there is no gas cap and gas-oil ratios would remain the same. Well potential is not a factor in setting allowable production, they added, so casing production would cause no infringement on correlative rights.

Amerada Gets Big Well

ROSWELL, N. M.—One of the highest flow rates recorded in the southwestern fields was gaged last week in the Moore-Devonian pool of the Caprock area of Lea County, New Mexico.

Amerada Petroleum Corp. 1-MA State, C SW 24-11s-32e, gaged an average of 151.62 bbl. of oil per hour during a 3-hour drill-stem test at 10,398-10,480 ft. in the Devonian dolomite.

Gas volume was only about 75 M.c.f. per day. Flow was made through 4½-in. drill pipe. Chokes were ⅝-in. bottom and 1-in. top.

It is the north offset to The Texas Co. 1 Moore, the pool's discovery well.

INDUSTRY AFFAIRS

Five Firms Dropped

Warren Petroleum Corp. to liquidate its subsidiaries

TULSA. — Warren Petroleum Corp. this week will liquidate five subsidiary companies.

After June 30, operations of four of the companies will be handled within divisions of Warren Petroleum Corp. They are Warren Oil Corp., Devonian Co., Warren Maritime Corp., and Warren Pipe Line Co.

The fifth subsidiary, Dri-Gas Crop., will be operated separately as a division of Warren Petroleum .

W. K. Warren, board chairman, and James E. Allison, president, said the liquidation is expected to result in more economical administration of the corporation and permit tax savings.

Warren Oil and Devonian have been engaged primarily in crude-oil and natural-gas operations. Warren Maritime operated barges, a ship, and a terminal at Newark, N. J., all for handling liquefied petroleum gas. Warren Pipe Line has operated a light-hydrocarbon gathering system and pipe line in Texas. Dri-Gas has served as wholesale and retail L.P.G. distributor in the Midwest.

Two of the companies have long histories in the oil industry. Devonian was a successor to Devonian Oil Co., founded in 1891 in Bradford, Pa.

Warren Oil Corp. originally was Heneghan & Hanlon, formed in West Virginia in 1904, and was one of the first builders and operators of natural-gasoline plants.

Narrows Crossing Completed

NEW YORK.—Transcontinental Gas Pipe Line Corp. successfully completed last week the pulling of a 6,500-ft., 24-in. submarine line across the Narrows at the entrance to New York Harbor, according to E. Clyde McGraw, vice president.

The pipe finally was pulled by substantially the same procedure followed during the first attempt early in May, when the pipe kinked 3,500 ft. from Staten Island after 4,800 ft. was in the water.

Subsequently the damaged line was retrieved on the Staten Island shore, cut in 800-ft. lengths, repaired, and rewelded.

Principal innovations in relaying by the submerged-flotation method were in the use of a swivel on the 1¾-in. cable, with which the pipe was winched from the Brooklyn shore, and a restraining winch on the Staten Island side.

Oil's Tax Facts Reviewed

FORT WORTH.—If all the taxes on petroleum operations and products were combined into a single tax, they would have resulted in a levy of $1.86 per barrel of crude produced last year.

Describing the confiscatory nature of present taxes, F. P. Hagaman, of Esso Standard Oil Co., New York, last week told the annual federal-tax forum of the Mid-Continent Oil and Gas Association that the oil industry must tell the general public the tax facts—that the oil industry is more than paying its way.

Only the "bulwark of public opinion," he said, can protect freedom of enterprise "in a world where all freedom is seriously threatened."

F. J. Blaise, Pure Oil Co., was named chairman of the standing committee on federal taxation for the coming year. Riley Frick, Tide Water Associated Oil Co., Tulsa, was named vice chairman.

Distinguished service awards were presented to three industry men now retired. They are T. H. Marshall, former executive vice president of Anderson-Prichard Oil Corp., Oklahoma City; S. M. Greenidge, formerly with Texas Pacific Coal & Oil Co., Fort Worth; and J. A. McNeese, formerly with Continental Oil Co., Ponca City.

Industry Briefs

ORANGE, Tex.—U. S. Steel Corp. has brought in its first well as an oil producer. The well, drilled on the 87-acre tract of the company's Consolidated Western Steel Division here, is the first producer ever completed within the city limits of Orange.

BATON ROUGE.—Louisiana's July allowable will be 7,868 bbl. daily higher than its June allowable. The state's conservation commission set the July figure at 675,342 bbl. daily, the second consecutive monthly increase.

CUSHING, Okla.—Employees at Deep Rock Oil Corp.'s 19,000-bbl. refinery here were going back to work last week. The strike, which began April 30, was ended when company and O.W.I.U. officials signed a new contract calling for a 15-cent-an-hour wage increase retroactive to December 16 and differentials for night shifts.

Iron-Curtain Report

Synthetic fuels play an important role in Soviet's fuel plans, but satellites have trouble expanding production

This is the last in a series of four articles on the petroleum industry in the eastern European countries controlled by Russia.

The first three articles appeared in the June 2, June 9, and June 16 issues of the Journal and were devoted to detailed accounts of crude-oil production and refining operations and to economic and political trends affecting the petroleum industry in each of the Iron Curtain countries.

G. G. Rosu

EASTERN Germany now leads all Russian satellites in the production of synthetic fuels, and production is still increasing.

Production this year is expected to average 1,318,000 tons (26,400 bbl. daily), making eastern Germany third in the list of fuel suppliers in the Russian orbit.

There are no known oil-bearing formations in the territory, except for an accidental discovery in a potash mine in Thuringia, which before the war yielded a small quantity of crude.

The German Government in 1946 did plan an exploratory program between Saxony and Hannover, but Russian seizure of all drilling equipment halted the project. It was proposed again in 1951. The metallurgical industry was ordered to speed up production of drilling equipment and steps were taken to train personnel to conduct an increased geophysical and geological program. So far, however, there have been no reports of discoveries.

Still growing . . . The East German synthetics program, a war-born development, has grown rapidly since the end of the war. From a mere 135,000 tons (2,700 bbl. daily) in 1945, production climbed to about 600,000 tons (12,000 bbl. daily) in 1948 and to 872,000 tons (17,400 bbl. daily) in 1950.

Last year output totaled 1,084,000 tons (21,700 bbl. daily), consisting of 654,000 tons (about 13,100 bbl. daily) of gasoline and 430,000 tons (8,600 bbl. daily) of diesel oil.

This year's planned production of 1,318,000 tons (26,400 bbl. daily), includes 838,000 tons (16,800 bbl. daily) of gasoline, and the rest diesel oil.

The stern determination of the Russian administration to meet these targets is reflected in the lifting of the lignite output goal for 1952 to 159,000,000 tons.

Only a small fraction of the territory's production is actually disposed of by the East German Government. Most of the plants are owned by the Soviet Government and have the status of extraterritorial Sowjet A.G. The accompanying table lists the existing processing plants and shows their approximate production capacity.

EASTERN GERMANY'S SYNTHETICS PLANTS

	Capacity (approx.)	
	Tons per year	Bbl. per day
Bergius process:		
Boehlen - Rotha (near Leipzig)	300,000	6,000
Leuna, Merseburg	300,000	6,000
Troeglitz, Zeitz	320,000	6,400
Luetzkendorf - Muecheln (at Krumpa)	125,000	2,500
Total	1,045,000	20,900
Fischer-Tropsch process:		
Ruhland-Schwarzheide	100,000	2,000
Luetzkendorf - Muecheln	60,000	1,200
Total	160,000	3,200
Carbonization process:		
Goelzau	60,000	1,200
Webau	40,000	800
Rositz	80,000	1,600
Total	180,000	3,600
Tar distillation:		
Koepsen	35,000	700
Edderitz	5,000	100
Boesdorf	5,000	100
Total	45,000	900

Note: The two Luetzkendorf - Muecheln plants and that of Boesdorf are East German operations (V.B.). Others are Russian owned (S.A.G.).

Other plants . . . In addition to the Luetzkendorf hydrogenation plant, which was initially designed for hydrogenation of petroleum residues, crude oil is also refined in the Klaffenbach (Erzgebirge) and Herrenleite (near Pirna) plants, whose cumulative charging capacity is of approximately 30,000 tons a year (600 bbl. daily).

Both are V.B.'s (People's enterprises). The Russians also own nine small-size chemical plants with a cumulative capacity of about 185,000 tons a year (3,700 bbl. daily) that are producing mainly lubricants. These units are obsolescent, and the process is uneconomic. The Buena Works at Shkopau is producing also a small quantity of lubricants (8,000 tons in 1950).

Currently, the Luetzkendorf and Herrenleite plants are processing Austrian crude. Last year, their supply from eastern Austria rose to approximately 120,000 tons (2,800 bbl. daily). Yield is disposed of entirely by the Russians.

Expansion under way . . . The 1951 production of synthetic fuel almost reached the theoretical limit of the capacity of the existing plants. A further increase in production must be anticipated by the expansion of plant facilities.

Apparently, this has already been started. For 1952 the German industry producing fuel-plant equipment has been ordered to increase its output by 67 per cent (priority is, however, given to briquettes presses).

Logically, the Leuna and Luetzkendorf (Fischer-Tropsch) plants should be enlarged by 300,000 tons (6,000 bbl. daily) and 100,000 tons (2,000 bbl. daily) respectively, because they have available the underground works required by such expansions.

As compared with the targets set for the domestic consumption for 1951, the German-owned production capacity was short by 30 per cent for diesel oil and 17 per cent for gasoline. Refining capacity for lubricants is sufficient, but other industrial oils must be imported. The fuel plants are being enlarged. Apparently, the enlargement will not be finished before 1953.

Meanwhile, the liquid-fuel shortage must be tackled by the German Government, for no Russian help for motor fuel can be expected. In addition to more plant capacity, the German Government plans to add an installation for tetraethyl lead to improve gasoline octane, and also a turbine-oil installation, to be built at the Luetzkendorf Fischer-Tropsch plant.

On the whole, far greater attention is being paid, however, to increasing the output, quality, and scale of the chemical products from coal distillation, such as naphthalene, toluene, phenol, benzol, and waxes.

Product distribution . . . Needless to say that the output of the S.A.G.'s (Soviet plants) is disposed of by Russia, although the needs of those plants

in coal and manpower are covered completely by the German Government. Moreover, the latter is sharing with Russia the distribution on the German market.

The Derunaft S.A.G. took over all distribution facilities of the foreign companies as well as many of those belonging to German interests. This company handles and markets the output of the S.A.G.'s and supplies Russian plants, Russian military, and civilian vehicles in East Germany. The Deutsche Kraftstoff und Mineraolzentrale, attached to the V.V.B. holding, handles only the retail distribution of oil products for the German consumption.

This East German organization has a very difficult task. Motor transportation must be increased to make up for the great number of locomotives and freight cars taken by the Russians. However, the number of motor vehicles is still below the prewar level. The result is, unavoidably, a serious transportation crisis. The civilian consumption, including bus transportation, already has been cut to the barest minimum. Last November, monthly allocations of motor-pool vehicles were cut from 112 to 50 gal.

Under the terms of the 5-year trade agreement of September 27, 1951, Russia is to provide East Germany with "oil and oil products for technical purposes." The former's obligation is, obviously, limited to covering German needs in industrial oil not produced by any of the V.B.'s. For the rest, the agreement is, apparently, settling merely the conditions under which Austrian crude will be processed in eastern Germany with "semifinished products of the gasoline industry."

Czechoslovakia

Czechoslovakian synthetic-fuel production comes from the Most (Bergius) plant, located near the East German border. It processes Brux and Falknov mines lignite.

As originally planned by the Sudetenlandische Treibstoffwerke A.G., its ultimate production capacity was set at 1,250,000 tons a year (25,000 bbl. daily), for which underground installations had been almost finished in 1944. The actually built capacity amounted to 400,000 tons a year (8,000 bbl. daily).

Allied bombardments put it out of action for a time, and destroyed part of the tankage capacity of 148,000 tons (925,000 bbl.). The aboveground structure has since been restored, partly redesigned, and completed with a lead tetraethyl installation.

Besides aviation gasoline, motor fuel, and kerosine, the plant produces oxygen, hydrogen, nitrogen, and gas. The latter is carried by pipe line to Prague.

Last year's production of synthetic oil is believed to have reached 250,000 tons (5,000 bbl. daily), which, according to official statements, was below the planned target. Apparently the coal shortage, which threatened to paralyze the Czech industry, was the main reason the goal was not fulfilled. Because of inherent Czech coal-mining conditions, this shortage may occur again this year.

The revised production target for 1953 is nearly 400,000 tons (8,000 bbl. daily) of synthetic fuel. This would require almost 4,000,000 tons of lignite.

Poland

Poland's synthetic-fuel producing facilities are still in the building stage and will not be finished before 1955 or later.

Sections of the new plants, however, may start operating when completed. Production costs of Polish synthetic fuel is bound to be high, in view of construction costs. But this factor does not seem to hinder Poland in her aspiration to reach self-sufficiency.

Poland several years ago completed plans for building a synthetic-fuel industry, but implementation of the program was delayed by lack of investment funds. In 1948 Russia granted investment credits, but no equipment has yet been delivered.

Extended shortage seen . . . By 1953 Poland hoped to have finished her synthetic-fuel projects and attain fuel self-sufficiency, and in the meantime the government covered most of her domestic requirements through an agreement with Great Britain. Under this arrangement, Britain promised to supply Poland during the period 1949-1953 with crude oil and products ranging from 180,000 tons per year (3,600 bbl. daily) to 220,000 tons (4,400 bbl. daily).

The shutdown in Iran stopped this supply and created a rather critical shortage. This explains why Poland, as well as Russia and Czechoslovakia, are anxious to negotiate, now directly, with Iran for an annual supply of at least 500,000 tons (10,000 bbl. daily) of crude.

Even if such negotiations are successful, however, there is little hope that the crude could be quickly moved into the Soviet area due to lack of tankers.

The result of this disturbance in the supply and in the building schedule is a fuel shortage which may last until 1955 and possibly later. Increased deliveries from Russia, Romania, and Eastern Germany could only alleviate the fuel crisis in Poland.

Cossel area work . . . Poland is building its plants from the remains of German plants built during the war.

With the exception of the small installation at Dwory, near Ausschqitz (Oswiecim), they are on former German territory east of the Oder-Neisse line, which was incorporated into Poland.

In the Cossel area on the Klodnitz Canal the Germans built three plants. These were Blechhammer North, using the Bergius process, which had a capacity of 50,000 tons per year (1,000 bbl. daily); the Blechhammer South, also Bergius, with an annual output of 100,000 tons (2,000 bbl. daily); and Deschowitz, which used the Fischer-Tropsch process and had a capacity of 110,000 tons (2,200 bbl. daily).

These plants sustained heavy damage during the war and, although much of the machinery was saved, the plants were dismantled by the Russians, who took most of the equipment. The Poles inherited little beyond the underground installations.

Since the beginning of 1951 the Poles have been rebuilding the Blechhammer South plant into what is described as "a great organic synthesis plant" designed to produce motor fuel, diesel oil, and a wide range of other products. Russia and Czechoslovakia are pledged to deliver the necessary machinery after 1953.

The magnitude of Polish planning is reflected in official statements that some 65,000 workers will be employed at Blechhammer South.

Dwory project . . . Another plant inherited by the Poles was one built by the Germans at Dwory, near Oswiecim. This was a Bergius plant with a working capacity of 20,000 tons a year (400 bbl. daily).

At this site the Poles later erected units dismantled from the second Ruhland-Schwarzheide plant and given Poland by Russia as war reparations. This was a Fischer-Tropsch installation with a working capacity of 250,000 tons a year (5,000 bbl. daily).

In July 1951 the installation was completed and both plants are now known as the Dwory Chemical Combine. The plants have since started small-scale production of a synthetic gasoline believed to be produced by a Russian method using lignite from the Cracow coal basin.

By 1955 this plant is expected to use 1,000,000 tons annually of lignite for the production of gasoline alone. Therefore it may be inferred that by that time the plant's production capacity for this product will be between 100,000

and 120,000 tons a year (2,000 to 2,200 bbl. daily).

Other plants . . . The Fischer-Tropsch plant built at Heydebreck (Kedzierzyn), with a working capacity of some 30,000 tons a year (600 bbl. daily) and which was damaged by land warfare, is now being used as a nitrogen plant.

The often-mentioned Politz plant, or more precisely, what remained after the Allied bombardments, was dismantled late in 1946 by Russia and carried away.

On the site remained only the quite valuable underground installations. This Bergius process plant was built with a capacity of 600,000 tons a year (12,000 bbl. daily). It included a paste preparation plant, and although originally designed for the hydrogenation of petroleum residues, it operated on bituminous coal and a variety of fluid feedstocks.

Bulgaria

The only country in the satellite area which does not produce either crude oil or synthetic fuel is Bulgaria. Bulgarian officials have recently expressed belief that the area along the northern half of the Bulgarian-Yugoslavian border may be oil-bearing.

More interesting is the statement made by the Premier Vulko Chervenkov in September 1951 that Bulgaria is on the way to producing "her own artificial gasoline from coal." Apparently Czechoslovakia would supply this country—sometime after 1954 or 1955—with a medium-size hydrogenation plant which would operate on Pirin lignite.

A definite conclusion is, however, difficult to draw. It is possible that this plan may have been dropped altogether.

According to a piece of news which leaked out several months later, Czechoslovakia was ready to start building two thermal processing plants to be erected in the two Bulgarian harbors, one at Burgas, with a charging capacity of some 700,000 tons a year (14,000 bbl. daily), and the other at Varna, for about 450,000 tons a year (9,000 bbl. daily).

If this is true, then it may mean that Russia is determined to get a substantial quantity of Middle East crude for a long period to come. Otherwise, it would not make sense to undertake big investments in the satellite area where the shortage of machinery is nortorious.

Prior to 1945 Bulgarian domestic consumption was entirely covered by Romania. This export continues but is now done instead by Russia from the production of her extraterritorial oil companies in Romania or through Sovrompetrol.

MIDDLE EAST

New Aramco Agreement

Saudi Arabia gets two directors, 50-50 split before U.S. taxes under new terms; other government requests pending

Dahl M. Duff

ARABIAN AMERICAN OIL CO. and the Saudi Arabian Government have agreed to revise terms of the company's concession to provide for a split of profits before payment of United States taxes and for the appointment of two Saudi Arabians to the company's board of directors.

Several other points raised by the government remain unsettled. They include the question of pricing Saudi Arabian crude at the full Persian Gulf posting and that of an accelerated acreage-relinquishment program.

The 50-50 participation agreement signed between Aramco and Saudi Arabia in December 1950 *(The Oil and Gas Journal, January 11, 1951, page 60)* listed United States income taxes as one of the items deducted from gross income. Under the new arrangement, the American taxes come from the company's share after the profits are split.

The loss to the company from this change is minor since the United States allows credit for foreign income taxes paid. Paying these taxes to Saudi Arabia rather than to the United States allows this revenue to go to the country in which the operation is taking place and whose resources are being used. The before-taxes 50-50 participation plan was established in last year's Iraq Petroleum Co., Ltd., agreement, and most concessions in the Middle East now contain what amounts to a "most favored nation" clause extending benefits obtained in other Persian Gulf oil countries.

Directors . . . The provision for two Saudi Arabs appointed by the king's government to the company's board of directors follows the pattern of closer identification between overseas oil companies and the countries where operations are being carried out. Aramco's recent action in transferring its headquarters and top management to Dhahran at the request of the Saudi Arabian Government conforms to this same trend.

The I.P.C. agreement also provided for two Iraqi members on that company's board. It is anticipated that the new Saudi Arabian members to Aramco's board will be announced soon.

Pricing . . . The changes in pricing for Saudi Arabian crude as proposed by the Saudi Arabian Government would be costly to Aramco's shareholders.

At present, these parent companies —Standard Oil Co. of California and The Texas Co. (operating jointly in the Eastern Hemisphere through Caltex), Standard Oil Co. (N.J.), and Socony-Vacuum Oil Co., Inc.—buy Saudi Arabian crude at a 32-cent discount under long-term purchase contracts.

Assuming three-fourths of the company's present production of roughly 800,000 bbl. daily moves to its parents, the additional annual cost would be about $70,000,000 a year. Half would go to the Saudi Arabian Government, and half to Aramco, some of which would later be recovered by the parents in dividends.

Aramco's original concession area in Saudi Arabia amounted to approximately 440,000 square miles. As provided in the concession, the company has been turning back to the government specified amounts of acreage each year. What the government is now asking is that this relinquishment program be speeded up. Whether the government has in mind granting these turned-back areas to other companies is not known.

Consultant rumored . . . Of interest in connection with Aramco-Saudi Arabian relationships is the persistent report that the Saudi Arabian Government is considering retaining an American oil man or firm in an advisory, consultant capacity. Reports are that the firm of DeGolyer & MacNaughton has been approached in this connection.

Armco itself has made no announcement on the concession-revision negotiations other than its statement early in May in which it said that the discussions were being carried on from time to time largely in connection with problems of implementing the 50-50 agreement. The company said that neither the agreement nor the royalty rate was at issue.

Points unsettled . . . What has been agreed on and what has been left unsettled thus far was outlined in a recent interview in Beruit by Shaikh Abdulla al Suliaman, minister of economics and

finances in the Saudi Arabian Government.

He pointed out that the concession contract had been amended on three previous occasions so that the revenue of the Saudi Arabian Government was increased to half a billion rials (about $135,000,000) a year, and that the company had in the past met various government requests, such as to give first-grade positions to Saudi Arabs, Arab refugees, and later to citizens of all Arab countries.

"Our negotiations with the company this year were not to ask for more revenue, as has been wrongly stated, but were of important and detailed matters which were not in accordance with the clauses of the 1950 agreement," he said. "We have arrived at settlement of some of the points, and some were left in abeyance pending further meetings to be arranged."

In discussing the two main points still unsettled — that of pricing the crude and the relinquishment program —Al Suliaman said that the company had been up to now unable to explore all of its concession territory. The company has discovered in addition a number of oil fields which it has drilled but never produced, he said. The Saudi Arabian Government has asked that the company leave the land it is not using and also leave the discovered area at present not produced by it, he said.

Court Hearing Ends

Ruling in Iranian case is expected before mid-July

THE International Court of Justice at The Hague wound up its hearings in the Iranian nationalization case last week, while the 632-ton tanker Rose Mary and its cargo of Agha Jari crude remained under injunction at Aden.

Final British arguments were presented before the world court June 23. Iran is contesting the court's jurisdiction over what it contends is a domestic matter. The British argued that the concession agreement actually was a treaty and that Iran violated international law in abrogating it.

Meanwhile, Anglo-Iranian Oil Co., Ltd., last week asked the Supreme Court of Aden to rule that the oil, which the Rose Mary carried, legally belongs to the company. The ship, which lifted the first cargo of Iranian oil since the nationalization, was impounded when it put in at the British colony.

Rulings in both the world court case and the suit at Aden are expected before mid-July.

Iranian feeling high . . . The injunction against the Rose Mary stirred feeling in Iran to a new pitch and brought charges that the British engaged in piracy on the high seas. The Swiss firm which chartered the Rose Mary again threatened legal action against the vessel's owners, claiming they had ordered the ship into Aden without authority.

Before leaving The Hague to return to Iran, Iranian Prime Minister Mossadegh said that his country would continue its efforts to sell oil, despite the fate of the Rose Mary. He said a ruling by the world court holding that it had jurisdiction would encourage such "abusive measures."

In an interview in the Dutch city, Dr. Mossadegh reiterated his antagonism to the company. "Not only will the Anglo-Persian Oil Co. never again return to Persia, but neither may a British technician ever come to our country," he said. "We can manage ourselves.

"American experts have estimated that we are able to refine 10,000,000 tons of oil a year (about 200,000 bbl. daily). That is one-third of what the British did, but it is a start. Abadan is idle, but we can get things going again in 6 or 7 months."

LATIN AMERICA

Chilean Plant Finished

A new 30,000,000-cu. ft. daily pressure-maintenance and natural-gasoline plant was scheduled to begin operations late in June in Manantiales field in southern Chile.

The plant was built by the Chilean government oil organization, Empresa Nacional del Petroleo. Hudson Engineering Co., Houston, had the contract for the design, engineering, and supervision of construction.

The plant is designed to produce 500 bbl. of propane, 300 bbl. of butane, and 100 bbl. of natural gasoline daily, while a small nearby crude distillation unit will produce motor fuel, kerosine, and diesel oil for E.N.A.P. and the local area.

Because of the increase in gas-oil ratio, Manantiales field has been closed in pending construction of the plant. Production of E.N.A.P.'s Tierra del Fuego fields is about 2,200 bbl. daily, about two-thirds of which comes from Victoria Sur and one-third from Cerro Sombrero.

A 20-mile, 6-in. line will pick up gas from these two fields for movement to the Manantiales plant. Five 660-hp. compressors will be used to return dry gas to the reservoirs. Operation of the new plant will allow a gradual increase in crude production.

AUSTRALIA

Terminals Being Expanded

The Australian company, Ampol Petroleum, Ltd., is currently engaged in a program to raise the capacity of its coastal terminals in Australia to a total of about 550,000 bbl.

This year's program includes new tankage at the Newport terminal in Melbourne, the Meandah terminal in Brisbane, and at Port Adelaide. Next year further storage capacity will be added at Brisbane and Port Adelaide.

AFRICA

Products Line Under Way

The 205-mile, 6-in. products pipe line being built from Ango-Ango to Leopoldville for Petrocongo is expected to be completed at the beginning of 1953.

The line is being built by four large companies, two American and two European, which market in the Belgian Congo. The companies, Socony-Vacuum Oil Co., Inc., The Texas Co., Royal Dutch-Shell, and Petrofina, undertook the project at the request of the Belgian Government.

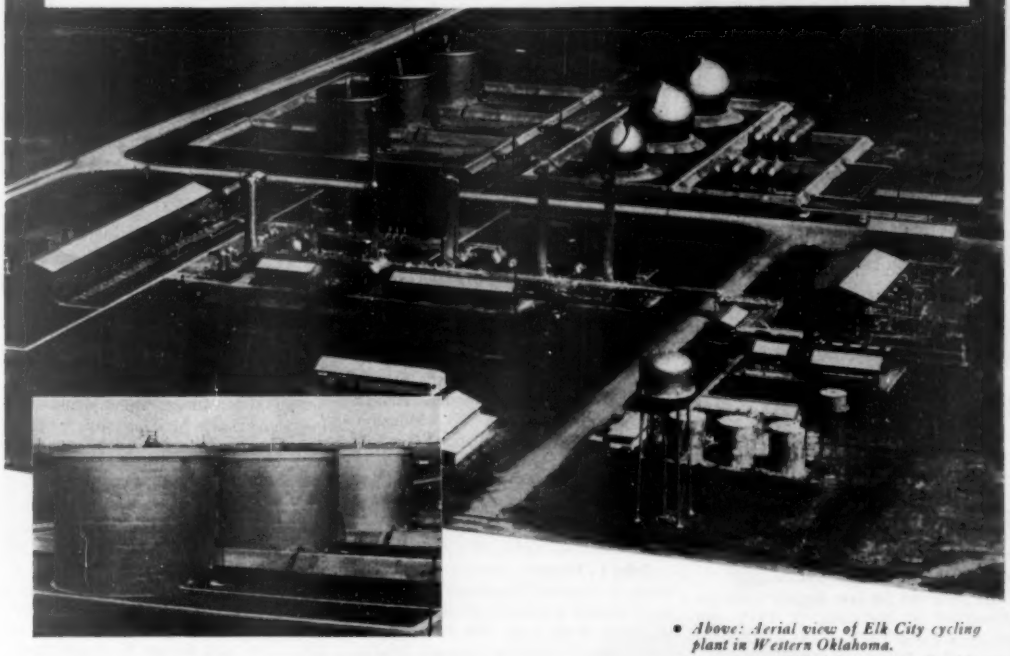
Initial throughput of the line will be about 9,400 bbl. daily. This will be increased later by the addition of more pump stations. The new line will carry motor fuel which, pending its completion, will continue to be sent to Leopoldville in rail tank cars at the rate of 13,000 to 14,000 tons a month. An old pipe line built in 1911 and 1912, will continue to carry gas oil. New storage facilities are to be built at Leopoldville.

International Briefs

Standard-Vacuum Oil Co. has opened a new housing development for company workers near Palembang, South Sumatra, the site of the company's 64,000-bbl. daily Sungei Gerong refinery. The development is a completely self-contained village with its own mosque, shops, and athletic field, according to Indonesian Information Service. At the official opening ceremonies, South Sumatran Governor Isa praised Stanvac for its efforts to build up its employes' standard of living.

Vacuum Oil Co., Pty., Ltd. (Standard-Vacuum) is planning the construction of a terminal near Nadi Airport in the Fiji Islands, according to reports from Melbourne, Australia. It will cost $270,000 and will refuel airlines on the proposed Canada - America - Australia run.

Modern Processing and Storage Facilities Conserve Oil and Gas at Elk City



- *Above: Aerial view of Elk City cycling plant in Western Oklahoma.*
- *Left: Three 24,000-bbl. Horton Double-Deck Floating Roof tanks. They are 60 ft. in diam. by 48 ft.*
- *Below: Two 15,000-bbl. Hortonspheroids 57 ft. 10⅛ in. by 49 ft. 10 in. and one 7,500-bbl. Hortonspheroid 45 ft. 6 in. by 40 ft.*

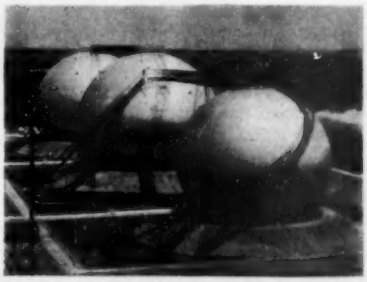
Field Unitized for More Profitable Operation

The Elk City oil and gas field in western Oklahoma has been operated as a unit since January 1st, 1951. A representative operating committee designated the Shell Oil Company as Unit Operator. Under the unitization plan, ultimate production of the field is expected to increase 25 per cent.

The Elk City plant, which was built by the Unit Operator, is owned jointly by nine oil companies. It handles both oil and gas produced from 106 forty-acre tracts in the unit area. After separating the crude oil from the gas, the plant extracts propane, butane and natural gasoline from the gas. Three-quarters of the processed gas is then returned to the producing formation.

Helping in these operations are three 24,000-bbl. Horton Floating Roof tanks, one 7,500-bbl. and two 15,000-bbl. Hortonspheroids, a 6-ft. diam. by 20-ft. gas separator, a 10,000-bbl. flat-bottom water tank and a 100,000-gal. Horton elevated water tank.

Write our nearest office for estimates or quotations.



CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3 ..... 2154 Healey Bldg.
Birmingham, 1 ..... 1536 North 50th St.
Boston, 10 ..... 1025-201 Devonshire St.
Chicago, 4 ..... 2128 McCormick Bldg.
Cleveland, 15 ..... 2204 Guildhall Bldg.
Detroit, 26 ..... 1514 Lafayette Bldg.
Havana ..... 402 Abreu Bldg.
Houston, 2 ..... 2119 C & I Life Bldg.
Los Angeles, 17 ..... 1523 General Petroleum Bldg.
New York, 6 ..... 3347—165 Broadway Bldg.
Philadelphia, 3 ..... 1615-1700 Walnut Street Bldg.
San Francisco, 4 ..... 1544—200 Bush St.
Seattle, 1 ..... 1325 Henry Bldg.
Tulsa, 3 ..... 1605 Hunt Bldg.
Washington 6, D. C. ..... 1139 Cafritz Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela
Comprimo, N.V., 21, Amstel, Amsterdam (C) Netherlands
Compagnia Tecnica Industria Petroli, Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Sociedade Chibridge de Construcoes Ltda., Av. Franklin Roosevelt, 194-S/704-C, Rio de Janeiro, Brazil

PERSONALS

Heads Company

Roland Rodman formerly was attorney in Nebraska

ROLAND V. RODMAN, Oklahoma City, the president of Anderson-Prichard Oil Corp., got his start in the oil business as a legal counsel.

He received his law degree from the University of Nebraska in 1919 and practiced from 1922 to 1937. Then he joined Bay Petroleum Corp., Denver.

He became vice president and general manager of Bay in 1939. In 1945 he was named president of Chalmette Petroleum Corp., a subsidiary of Bay, and was made president of Bay in 1946. He resigned from Bay in June, 1947, to head Anderson-Prichard.

Secretary of Interior Oscar Chapman appointed him a member of the National Petroleum Council for 1950. Rodman also is a director of the Independent Petroleum Association of America.

He now makes his home in Oklahoma City where he is active in civic affairs. He is vice president and a director of the Chamber of Commerce there.

W. K. Holm, formerly foreman for Natural Gas Pipeline Co. of America, at Knoxville, Tenn., has been appointed corrosion engineer for Texas Illinois Natural Gas Pipeline Co. at Conroe, Tex.

Clifton C. Cross, president of Trans Empire Oils, Ltd., since its inception in 1950, was elected chairman of the board of directors at a recent meeting in Calgary, Alta. **John D. Boyd** was named to succeed Cross as president and general manager.

H. A. Rhodes, superintendent of communications for Transcontinental Gas Pipe Line Corp. at Houston, has been reelected chairman of the National Petroleum Radio Frequency Coordinating Association. Other members of the executive committee elected at a recent meeting in Washington, D. C., are: **L. E. Cook,** Sinclair Pipe Line Co., Independence, Kans., vice chairman; **W. A. Simpson,** Virginia Gas Transmission Co., Falls Church, Va., secretary; and **C. D. Campbell,** Humble Pipe Line Co., Houston, and **Dr. R. D. Wyckoff,** Gulf Oil Corp., Pittsburgh. Seven regional chairmen elected at regional meetings prior to the national conference are: **D. K. Ruth,** Manufacturers Light & Heat Co., Pittsburgh; **J. C. William,** Ohio Fuel Gas Co., Columbus, Ohio; **D. R. Wofford,** Texas Gas Transmission Corp., Owensboro, Ky.; **McKinly Rhodes,** Tennessee Gas Transmission Co., Houston; **W. B. Haas,** Northern Natural Gas Co., Omaha; **T. A. Wilson,** Southern Union Gas Co., Farmington, N. M., and **W. E. Church,** Shell Oil Co., Los Angeles.

John C. Sample, assistant to the president of General Petroleum Corp., has been elected a member of the board of directors of the firm. He formerly was a director of Standard-Vacuum Oil Co.

C. L. BURRILL

Cecil L. Burrill will be in charge, effective September 1, of the New York office of Creole Petroleum Corp., Venezuelan affiliate of Standard Oil Co. (N. J.). He returned to Creole in June after serving 18 months as director of the program division of the Petroleum Administration for Defense. In New York he will replace **Lloyd G. Smith,** Creole vice president and director, who will devote his remaining time until retirement to company refining problems.

Harley M. Ross, superintendent of the Texas City, Tex., plant of Carbide & Carbon Chemicals Co. since 1941, has been appointed assistant works manager for the company in New York. **E. J. Fox,** assistant superintendent, has been promoted to superintendent. New assistant superintendents at the Texas City plant include: **Robert Dillon,** in charge of chemical production units, chemical shipments, and works laboratory; **T. A. Wilker,** in charge of Vinylite production, shipments, and laboratory, replacing **C. L. Pitzer,** who has moved to New York to work on production problems; and **H. E. Ailspach,** in charge of maintenance, utilities, works engineering and industrial relations.

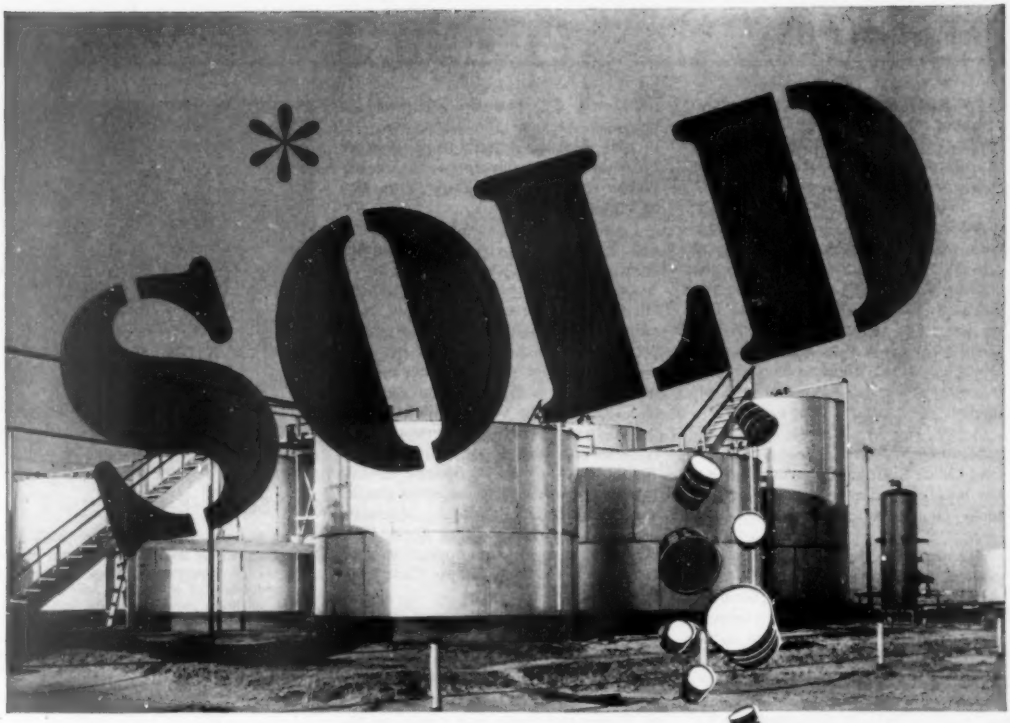
Lamar McLennan, Jr., district geologist for Seaboard Oil Co. of Delaware in Midland, Tex., has been promoted to an assistant to the chief geologist at division headquarters in Dallas. He will be succeeded in Midland by **Roe E. Goodwin,** who has been his assistant about a year.

John T. Hammett, intermediate petroleum engineer for Sinclair Oil & Gas Co. at Wink, Tex., has been promoted to assistant district foreman at Big Spring, Tex. Other company changes include: **Francis M. Singleton,** intermediate petroleum engineer at Fort Worth, promoted to assistant district foreman at Gainesville; **Leslie M. Sellers,** intermediate petroleum engineer at Covington, Okla., promoted to senior petroleum engineer at Pampa, Tex.; **Bill R. Roark,** senior petroleum engineer at Pama, Tex., transferred to Odessa, Tex.; **Cameron L. Cox,** assistant district foreman at Columbus, Tex., transferred to Arp., Tex.; and **James W. Vanderbeck,** roustabout at Delaware, Okla., promoted to junior petroleum engineer at Gainesville, Tex.

Louis A. Consiglio has joined the producing, pipe-lines, and transport department of Arabian American Oil Co. in New York. He recently received a degree in geology from New York University. **Vincent E. Rex,** who recently obtained a degree in petroleum refining engineering from the Colorado School of Mines, also has joined the department. **William A. Weber,** formerly with Standard Oil Co. (N. J.) has joined Aramco's domestic engineering department.

DeLasso Loos, formerly assistant superintendent for Blackwood & Nichols Co. at Midland, Tex., has been promoted to superintendent for the New Mexico-Colorado district at Durango, Colo.

Dr. C. M. Blair has been named superintendent of the new chemicals and plastic resins plant to be constructed at Seadrift (Calhoun County), Texas, by Carbide & Carbon Chemicals Co., a division of Union Carbide & Carbon



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PERSONALS

Corp. **R. P. Barry, Jr.,** area supervisor of chemical production in the superintendent's department of the South Charleston plant, has been appointed assistant superintendent at Seadrift.

James L. Martin, geologist for Sinclair Oil & Gas Co., has been elected president of the Mississippi Geological Society for 1952-53. Other officers include: **S. W. (Stan) Totten,** The California Co., vice president: **William Hendy,** Magnolia Petroleum Co., secretary, and **A. E. Blanton,** Sun Oil Co., treasurer. They will take office in September.

Rexford S. Blazer, president of Ashland Oil & Refining Co., Ashland, Ky., has been elected a director of the Kentucky Heart Association, Inc.

Harold M. Madsen has been appointed administrative assistant to the general manager of manufacturing of Standard Oil Co. (Ind.). He formerly was supervisor in the training section of the industrial-relations division at the company's Whiting, Inc., refinery. He joined Standard in 1928 at Whiting.

T. R. Ragland, Jr., superintendent of the South Charleston, W. Va., plant of Carbide & Carbon Chemicals Co. since 1945, has been appointed manager of the new gas-procurement department of the company, with headquarters in New York. He will be succeeded in his old job by **D. B. Benedict,** formerly assistant superintendent of the plant in charge of chemicals and resins.

A. L. Nickerson, vice president in charge of foreign operations, Socony-Vacuum Oil Co., Inc., New York, has been reelected vice president in charge of the marketing division of the American Management Association for 1952-53.

John A. Clark, president of Hope Natural Gas Co., Clarksburg, W. Va., has been elected a director of Consolidated Natural Gas Co., the parent company. He replaces **Loring L. Tonkin** of Hope Natural, who will retire July 1.

H. D. (Dean) Murray has been named in charge of the new drilling and production office of Hanley Co. in Midland, Tex. For the past 20 months he has served in the army. Formerly he was a partner in Cren-Ray Co., Midland oil-field service concern, and district petroleum engineer for The Texas Co. in the Permian basin.

Marvin L. Drabkin, formerly a chemical engineer for The Texas Co. at the Beacon Laboratories, Beacon, N. Y., has been appointed process engineer for Catalytic Construction Co. at Philadelphia.

J. F. McDonald has been promoted from district production engineer to assistant district superintendent for Gulf Oil Corp. at Kiefer, Okla. Other company changes include: **H. F. Swannack,** promoted from district production engineer to assistant district superintendent of the Illinois-Indiana-Kentucky district at Centralia, Ill.; **W. D. Mitchell,** promoted from district production engineer to assistant district superintendent at Ardmore, Okla.; **L. R. Spence,** drilling foreman, promoted to assistant district superintendent in the Rocky Mountain area at Casper, Wyo., and **G. S. Winchell,** assistant district production engineer, promoted to Ardmore (Okla.) district production engineer.

N. C. McGowen, president and director of United Gas Corp., and **Daniel W. Spurlock,** special assistant to the senior counsel for Esso Standard Oil Co., both of Shreveport, have been named to the Louisiana State Board of Commerce and Industry by the governor.

J. M. Shepherd, formerly assistant district superintendent for Humble Oil & Refining Co. at New London, Tex., has been appointed district superintendent for the company at Bakersfield, Calif.

Burns M. Crotty has resigned as geologist for Cabot Carbon Co. to become a consultant at Midland, Tex. He formerly was a geologist for Stanolind Oil & Gas Co. in Midland 4 years.

R. M. Wemple has been promoted by Pan American Production Co. from district production foreman at Lyford, Tex., to district superintendent at Grand Chenier, La.

Gilbert Estill, superintendent of gas measurement for Oklahoma Natural Gas Co., has been elected president of the Tulsa chapter of the Instrument Society of America. He has been with Oklahoma Natural Gas Co. 35 years.

John B. Nunn has been appointed division manager and **Milton Kuhleman** has been named division geologist in the new offices of Ashland Oil & Refining Co. to be opened around July 1 in Billings, Mont.

For Safety Record

C. F. Bronson, left, manager of Ohio Fuel Gas Co.'s Elyria district, receives an American Gas Association certificate recognizing the completion of more than 5,000,000 man-hours of work without a lost-time injury. Presenting the award is W. H. Adams, A.G.A. safety consultant. Elyria district employes topped their own previous record of more than 4,000,000 man-hours reached in 1950 to earn the new award.

Allen P. Bowie has been granted a leave of absence from General Petroleum Corp. to serve as chief of petroleum reserves for the Petroleum Administration for Defense in Washington, D. C. Before assuming his government duties in June he was district petroleum engineer in the company's exploration division offices in Ventura, Calif. **Innes M. MacKenzie, Jr.,** has been transferred from the Los Angeles office to succeed Bowie.

William H. Miller, assistant general manager of Standard Oil Co. (Ind.), has been elected to the board of trustees of Parsons College.

Robert Leibee has been appointed senior analytical chemist for Continental Oil Co. at Lake Charles, La.

C. V. Dittman, superintendent of the Salinas Valley (California) district for General Petroleum Corp., has been transferred to the San Ardo district, where he will have charge of all production department activities. He formerly was drilling superintendent for the production department in the San Joaquin division. **N. W. Schultz,** petroleum engineer, has been transferred from exploration offices in Bakersfield to head petroleum-engineering activities in the San Ardo area.

PERSONALS

George H. Dent has been promoted to division engineer for The Asphalt Institute at Washington, D. C., in charge of the institute's Division 1. He has been with the institute since 1941.

W. W. Donaldson, Petersburg, Ind., has retired after 52 years in the oil business. **James Welch** succeeds him as general superintendent of Graham Development Co., Washington, Ind., a position Donaldson had held for 5 years.

J. A. Waltman has been transferred from the Glendale office of Southern California Gas Co. to Visalia as division engineer for the San Joaquin Valley. He replaces **R. D. Pruitt,** who resigned.

Paul Mitchell, formerly toolpusher for Rocky Mountain Drilling Co. in San Joaquin Valley, has been promoted to superintendent of the Los Angeles basin division. He succeeds **L. A. Whipple,** who has been transferred to the Beverly Hills main office.

F. W. Bell, formerly senior geologist in Shell Oil Co.'s area exploration department, has been placed in charge of the company's revamped Coastal California division at Ventura. The new division covers southern California and coastal California north to Oregon. **V. W. Finch,** formerly division geologist of the coastal division, succeeds Bell as area senior geologist. Other recent changes in Shell's West Coast exploration department include **G. C. Kuffel,** from division stratigrapher at Long Beach to senior geologist at Los Angeles; and **R. A. Hoffman,** junior geologist, transferred from Ventura to Bakersfield.

J. B. Newland, formerly associated with Imperial Oil, Ltd., Calgary, has joined the firm of Trafford & Associates, Calgary, as senior geologist. **K. R. Stout,** exploitation engineer, has been made a junior associate of the firm.

Scott P. Ewing, Jr., junior petroleum engineer for Carter Oil Co., has been transferred from Shreveport, La., to Magnolia, Ark.

E. C. James, exploitation engineer for Shell Oil Co., has been transferred from New York to the company's Rocky Mountain division at Casper. Other changes in Shell's California area offices include **Stanley A. Beck,** exploitation engineer, transferred from Ventura to Long Beach; **A. L. Diehl,** from Long Beach to Bakersfield as exploitation engineer; and **W. J. Wagner,** mechanical engineer, moved from Long Beach to Ventura.

Stuart Carter, formerly division geologist for Continental Oil Co. at Roswell, N. M., has been appointed assistant regional geologist at Denver.

Amedeo Giallorenzi, Baton Rouge, La., has been named an assistant director of the Petroleum Administration for Defense's supply and transportation division. Giallorenzi, who has been with Standard Oil Co. (N. J.) or its affiliates since 1935, succeeds **Perry Peterson.**

C. E. Ikeler, formerly chief engineer for Texas Natural Gas Corp. at Anson, Tex., has been appointed plant operator for Round Top Oil Co. at Hamlin, Tex.

Frank M. Partridge of Southern California Gas Co. has been elected president of the Southern California Meter Association. He succeeds **M. C. Bennett** of Southern California Edison Co. **James A. Serey, Jr.,** Southwest Exploration Co., was elected vice president; **G. H. Forster, Jr.,** The Texas Co., was reelected secretary-treasurer, and **C. B. McKinney,** Southern Counties Gas Co., was reelected auditor. **Glen C. Wilson,** Southern California Gas Co., was chosen to head the program committee for the coming year.

Ray L. Losure, assistant foreman for Sinclair Oil & Gas Co., has been transferred from Bonita to Big Spring, Tex.

E. S. Arnold, assistant district superintendent for Phillips Petroleum Co. at Eureka, Kans., has been promoted to assistant division superintendent at Ponca City, Okla.

DEATHS

Neff Haynes, 91, pioneer Tulsa driller and oil worker, died there June 17.

Ogden E. Crosby, Sr., 61, formerly an operator in the research pilot plant of Standard Oil Development Co. at Linden, N. J., died June 17 at his home there. He retired last year after serving 30 years at the plant.

Ralph Watt, 70, former official of Red River Refining Co., now known as Calumet Refining Co., died June 22 at Pascagoula, Miss.

John J. Bush, 83, widely known oil lease broker, died June 21 at his home in Pecos, Tex.

George V. Graner, 59, Venice, Fla., founder and president of Graner Oil Co., died June 14. He was a native of Plainville, Minn.

Dr. Andrew Cowper Lawson, 90, professor emeritus of geology at the University of California, died June 16 at Berkeley.

William H. Yoke, field superintendent for the old Tidal Oil Co., died June 20 in a Bartlesville, Okla., hospital.

Elmer Grant Woodruff, 80, Tulsa, consulting geologist for The Texas Co. in the Mid-Continent area, died June 25 in Tulsa. He served many years with various oil companies throughout the Southwest and worked with the U. S. Geological Survey 3 years until 1907.

Dr. Stanley J. Seeger, Dallas, president of Nebo Oil Co. and Bodcaw Oil Co., Inc., died June 20 in New York City.

S. H. Casteel, formerly chief geologist for Landreth Corp., Fort Worth, died June 20 in Dickins, Tex. He also formerly was associated with Humble Oil & Refining Co. and with Producers & Refiners Corp. at Casper, Wyo.

Benjamin James Hill, 66, Tahlequah, Okla., formerly field and division superintendent for Kewanee Oil Co. for the South Oklahoma-North Texas area at Tulsa, died June 18 in Tahlequah.

Phineas Chester Thompson, retired geologist, died June 20 in New York. A pioneer in developing oil fields in Colombia, Venezuela, and Madagascar, he was an organizer of the Creole Syndicate and a former president of the Royal Canadian Oil Syndicate.

James Davis, 76, executive vice president of Solar Oil Corp., died recently in Wichita, Kans. He had been an independent drilling contractor and producer in Pennsylvania, West Virginia, Ohio, Illinois, and Kansas.

Three Actual Cases

Demonstrate Flexible Refinery Operation

The Numex refinery of the New Mexico Asphalt & Refining Co. operates its package T.C.C. unit according to three plans. All refining units are utilized in Case 1, to give balanced yields of straightrun and catalytically cracked products. In Case 2, all crude is charged to T.C.C. unit, eliminating several operations, with two advantages:

1. Octane number improvement.

2. Maintenance turnaround of idle units accomplished without diminishing crude run or product quality.

In Case 3, topped crude and straightrun gasoline are added to whole crude. Advantages are:

1. Production of required straightrun fractions.

2. Octane number improvement over Case 1.

by Claude L. Withers*

THE first of the "packaged" air-lift T.C.C. units, designed to produce catalytic gasoline economically in the small refinery, completed its initial 6 months of operation in March of this year. This 6,000-bbl. per day unit was installed by the New Mexico Asphalt & Refining Co. (Numex) at its Artesia, N. M., plant during its recent modernization project. The unit was built by the Southwestern Engineering Co. and is licensed by the Socony-Vacuum Oil Co., Inc.

The oil-processing facilities at the Numex refinery consist of crude distillation, thermal cracking, T.C.C. catalytic cracking, catalytic polymerization, and gasoline treating. Descriptions of equipment on the T.C.C. and catalytic polymerization units were given in the Journal, January 21, 1952, page 92.

The charging stock to the T.C.C. unit has been changed frequently. Alterations are made to meet changes in crude production schedules, in local marketing conditions, and in product specifications.

Three of the major changes are described in detail, to illustrate the flexibility of operation.

(Continued on page 84)

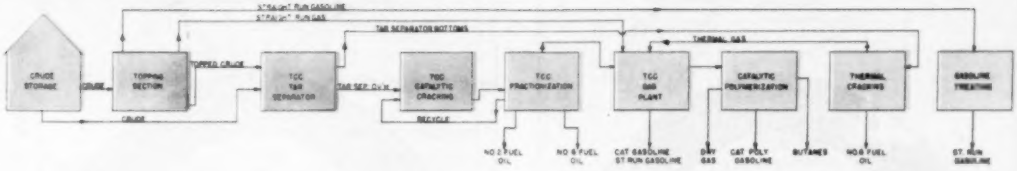
*Vice president, New Mexico Asphalt & Refining Co.

TABLE 1—T.C.C. SECTION MATERIAL BALANCES

Process streams—	Case 1 °A.P.I.	Case 1 B/D	Case 1 M≠/D	Case 1 Vol. %	Case 2 °A.P.I.	Case 2 B/D	Case 2 M≠/D	Case 2 Vol. %	Case 3 °A.P.I.	Case 3 B/D	Case 3 M≠/D	Case 3 Vol. %
CHARGE:												
Straightrun gasoline to T.C.C. tar separator									59.0	883	229.6	17.5
Crude to T.C.C. tar separator	33.9	3,470	1,037.0	89.0	34.0	5,800	1,735.0	115.5	34.6	4,140	1,233.7	82.2
Topped crude to T.C.C. tar separator	21.9	2,055	664.0	52.6					21.7	1,317	425.4	26.2
Gas oil to T.C.C. tar separator					39.5	230	66.5	4.6				
Total to T.C.C. tar separator		5,525	1,701.0	141.6		6,030	1,801.5	120.1		6,340	1,888.7	125.9
Tar separator bottoms make	15.7	1,625	546.0	41.6	14.8	1,012	342.0	20.1	13.5	1,306	445.3	25.9
Fresh feed to T.C.C. reactor		3,900	1,155.0	100.0		5,018	1,459.5	100.0		5,034	1,443.4	100.0
Recycle feed to T.C.C. reactor		1,335				1,380				1,440		
Total feed to T.C.C. reactor		5,235				6,398				6,474		
Thermal gas to T.C.C. gas plant			27.3									
Straightrun gas to T.C.C. gas plant			14.1								9.2	
Total to T.C.C.			1,196.4								1,452.6	
PRODUCTS:												
Debutanized T.C.C. gasoline (420° e.p.)	54.7	2,560	681.0	65.7	54.8	3,420	910.0	68.1	54.4	3,626	964.5	72.0
Cat. poly gasoline (435° e.p.)		301	78.2	7.7		229	59.5	4.6		199	51.7	4.0
Butanes to gasoline blending		278	55.6	7.1		317	63.4	6.3		378	75.6	7.5
No. 2 fuel oil (520° e.p.)	32.0	335	101.5	8.6	31.0	460	140.2	9.2	28.3	422	130.8	8.4
No. 6 fuel oil	16.9	309	103.2	7.9	15.3	318	107.1	6.3	13.1	190	65.0	3.8
Refinery fuel gas			81.3				94.0				73.2	
Coke			79.2				77.0				79.2	
Total products		3,783	1,180.0	97.0		4,744	1,451.2	94.5		4,815	1,440.0	95.6
Octanes*—Research clear		*79.2				*82.0				*81.0		
OPERATING CONDITIONS:												
Catalyst to oil ratio, vol.		5.7				4.7				4.6		
Space velocity, V./hr./V.		0.8				0.97				0.98		
Recycle ratio, V. rec./V.F.F.		0.34				0.28				0.29		
Catalyst activity index		34.5				33.5				32.0		
Average reactor temperature, °F.		833				850				850		
Vapor to reactor temperature, °F.		763				770				775		
Catalyst to reactor temperature, °F.		908				950				952		

*Includes large amounts of straightrun gasoline.

CASE 1—Using All Process Sections



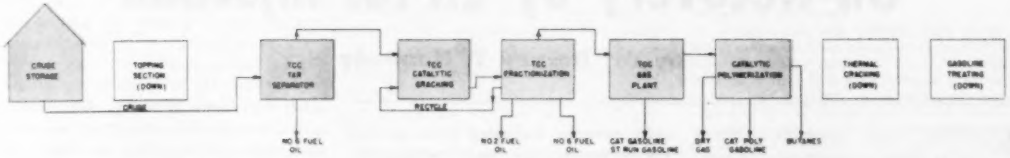
Operation: Topped crude, whole crude and partial straightrun gasoline . . . All the refinery oil processing facilities are in use. Part of the crude oil flows to the topping section of the plant and a part flows directly to the tar separator section of the T.C.C. unit. Since available crude charge for catalytic cracking is less than the nominal capacity of the unit, reduced crude is also introduced to the tar separator. The amount of topped crude available for catalytic cracking is limited by the market requirements for middle distillates, as only the amount of crude necessary for these products is charged to the distillation unit.

The straightrun gasoline and the gas oil from the tar separator pass to the T.C.C. reactor. The gasoline product goes through the usual processing. The straightrun gasoline from the topping section is charged directly to the gasoline treater.

The wet gases from topping and thermal cracking are sent to the gas plant section of the T.C.C. unit. The gas from the T.C.C. gas plant is sent to the catalytic polymerization section where dry gas, butanes for gasoline blending, and catalytic polymerization gasoline are produced.

The tar separator bottoms are fed to the thermal unit for visbreaking to No. 6 or bunker fuel specifications.

CASE 2—Topping, Thermal Cracking, Treating Sections Shut Down



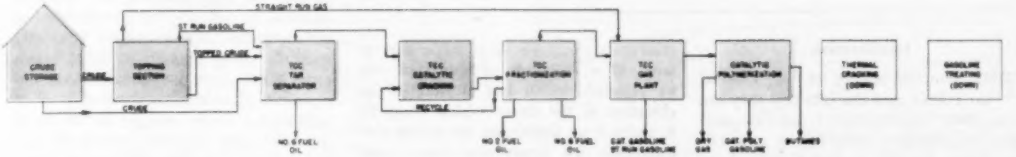
Operation: Whole crude . . . The topping, thermal cracking and gasoline treating sections are shut down. A change in product requirements make it desirable to run with 100 per cent whole crude charged to the tar separator of the T.C.C. unit. Total overhead from the tar separator passes to the T.C.C. reactor. The tar separator bottoms go directly to fuel instead of to thermal cracking.

This operation makes it possible to effect a saving by shutdown of crude distillation, gasoline treating and thermal cracking facilities for maintenance turnaround without reducing gasoline quality or decreasing crude run.

The original modernization program in the refinery had not included any additional facilities for gasoline treating. Therefore, since the crude run was doubled, it was necessary to plan that excess straightrun gasoline would be charged to the T.C.C. unit to take advantage of its desulfurizing abilities. It is of considerable commercial significance to note that not only was the straightrun gasoline satisfactorily desulfurized by the T.C.C. operation, but also the operation was further justified by the increase in clear octane numbers obtained on the straightrun gasoline.

The whole crude operation on the T.C.C. indicated that in addition to the desulfurization which gave increased lead susceptibility, the straightrun gasoline was improved by 13 research, clear, octane numbers when charged to T.C.C. instead of to gasoline treating plant.

CASE 3—Thermal Cracking, and Treating Sections Shut Down



Operation: Crude and straightrun . . . The thermal cracking and gasoline treating sections are shut down. The charge to the T.C.C. tar separator consists of whole crude, topped crude and straightrun gasoline.

The octane number improvement demonstrated in the whole crude operation for processing the straightrun naphtha is used to advantage when the crude distillation units are placed in service to produce required straightrun kerosine and diesel products.

Under this operation the middle distillate products are obtained by sending to the crude distillation units the minimum amount of crude required for these straightrun products. Then the charge to the T.C.C. unit itself consists of whole crude, topped crude and straightrun gasoline.

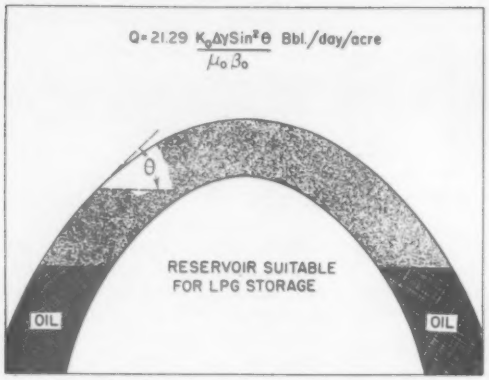
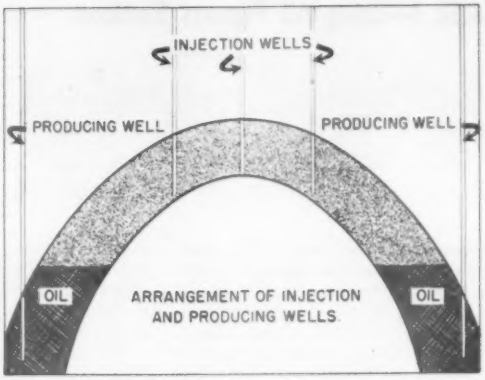


Fig. 1—Reservoir with substantial inclination of pay formation (angle θ, inclination to horizontal). In left drawing the equation, by M. Muskat, shows "free oil" flow of oil downstructure due to action of gravity alone. Drawing at right shows general arrangement of injection and producing wells.



NEW OIL-RECOVERY METHOD?

Oil Recovery by L.P.G. Injection

by Dr. Harvey T. Kennedy

EDITOR'S note: Some new thinking in terms of reservoir engineering, or perhaps even a new type of oil recovery process, is indicated by the contents of this article. Dr. Kennedy, the author, states his conclusions on the subject as follows:

"A quantitative treatment of the problem of oil production in depleted oil reservoirs by L.P.G. injection indicates that:

1. Substantial oil production should result from typical oils from reservoirs of 10° and higher slope.

2. With higher slopes, the possible production increases sharply.

3. Methods are outlined by which the production of oil from any reservoirs may be estimated from K — p curves on the rock, and viscosity and molecular weight data on the oil."

And Dr. Kennedy also suggests that the recoveries from this method might be:

"Laboratory tests in which a reservoir was simulated by an oxygen-type cylinder filled with sand and saturated with oil, indicate recoveries as high as 98 per cent may be obtained by merely connecting up to a propane container and producing from an outlet in the bottom of the cylinder. While comparable recoveries would not be predicted for actual reservoirs, it would not be unreasonable to expect substantially higher recovery than is obtainable by any other production method."

Introduction

THE seasonal nature of the demand for L.P.G. and the fact that they are frequently byproducts of natural gasoline manufacture, often makes unusually large storage capacity for them necessary. Depleted gas-drive reservoirs represent one of several possibilities for this purpose. At moderate depth, say 1,000 or 2,000 ft., they are adequate to hold any required pressure. Except for the wells, which may be utilized or easily plugged, they are leakproof. And even a small reservoir, as reservoirs go, is a very large storage tank. **If a reservoir of this type can be selected which has substantial inclination to the strata which comprise it, there is an additional advantage that important oil production may result from the swelling and thinning effect of the L.P.G. on the residual oil.**

Pore space . . . In solution gas-drive reservoirs depleted by primary producing methods, one can expect to find from 1,000 to 2,000 bbl. of gross pore space per acre-foot. Generally 20 to 30 per cent of this space will be filled with connate water. This water is usually immobile, and its importance as regards L.P.G. storage is limited to its effect in reducing the capacity and increasing the facility of oil removal. The latter function is served by virtue of the fact that water occupies the smaller pores and tighter sections of the reservoir, leaving oil and gas in the more open interstices. The remaining pore space, averaging perhaps 1,000 to 1,200 bbl. per acre-foot in sandstone reservoirs, may be expected to contain at least 50 per cent of its volume of oil. **The gas content of depleted gas-drive reservoirs is sufficient to provide a continuous path for injected gas, allowing it to permeate substantially all parts of the reservoir.**

The first requirement for any underground storage reservoir is favorable location in relation to production or consumption centers. The capacity must be large enough to meet maximum needs, but not so large that unreasonably low pressures will exist when withdrawal from storage is required. In order that injection pressures may not greatly exceed withdrawal pressures, the permeability of the reservoir should be continuous and high, say at least 1,000 md. Additional requirements for storage projects in which oil production may be a consideration are (a) substantial dip to the strata, as already noted, and (b) wells penetrating the lower extremities

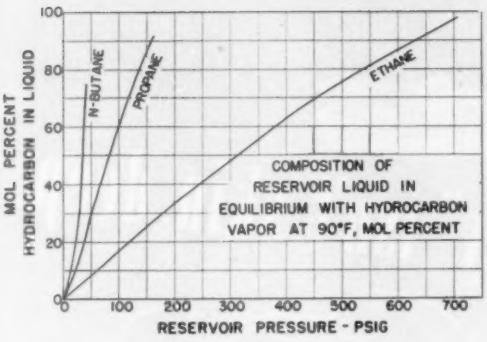

MOL PERCENT HYDROCARBON IN LIQUID
N-BUTANE
PROPANE
ETHANE
COMPOSITION OF RESERVOIR LIQUID IN EQUILIBRIUM WITH HYDROCARBON VAPOR AT 90°F, MOL PERCENT
RESERVOIR PRESSURE - PSIG

Fig. 2.

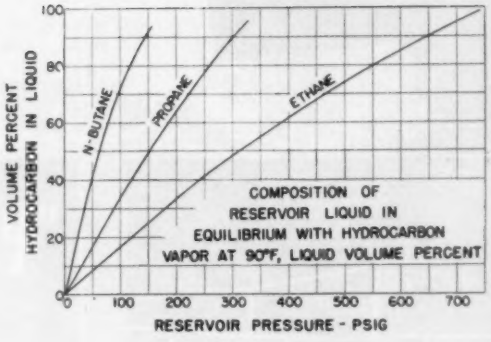

VOLUME PERCENT HYDROCARBON IN LIQUID
N-BUTANE
PROPANE
ETHANE
COMPOSITION OF RESERVOIR LIQUID IN EQUILIBRIUM WITH HYDROCARBON VAPOR AT 90°F, LIQUID VOLUME PERCENT
RESERVOIR PRESSURE - PSIG

Fig. 3.

of the reservoir, and not in contact with the upper portion. These wells will normally be available in most reservoirs drilled in the usual manner.

Type reservoir . . . Fig. 1 shows a reservoir of the type described. The angle Θ is the inclination to the horizontal of the strata, and the equation, developed by Muskat,[1] shows the "free-fall" flow of oil downstructure due to the action of gravity alone. Before L.P.G. injection is started the production is very small because K_o, the effective permeability of the sand to oil, is near the vanishing point.

When injection is started, L.P.G. is absorbed from the gas phase into the oil, increasing its volume, and consequently increasing K_o. By the same process, the viscosity, μ_o, is substantially reduced, as are the forces of surface tension which tend to hold oil in the upper parts of the structure against the action of gravity.

Two factors, the reduction of $\Delta\gamma$, (the density difference between liquid and gas) and of β_o, (the reservoir volume factor) act to reduce the downward movement of oil. A comparison of the relative magnitudes of the changes in oil and gas properties, however shows that there is a large net increase in the gravitational flow following L.P.G. injection.

By the application of K values, the effect of the condensable gases ethane, propane, and normal butane in increasing the volume of the residual oil in the reservoir may be calculated. Isobutane is not considered, since it would seldom be available in purity sufficient to warrant separate calculation. Obviously, its effect as a constituent of normal butane would be to move the properties for the latter in the direction of the values for propane.

Fig. 2 shows the mol per cent of each of the hydrocarbons in a 200 molecular weight oil at 90° F., at pressures ranging from zero absolute to the vapor pressure of each hydrocarbon. The temperature of 90° F. was selected as representing the average temperature in a reservoir of 1,500-ft. depth in the North Texas or Mid-Continent area. It is to be noted, that if a depleted reservoir is at atmospheric pressure when L.P.G. injection is started, the absolute pressures on the figure will represent gage pressures as measured in the reservoir, as far as liquid composition is concerned.

Fig. 3 shows the composition of the liquid in the reservoir in terms of liquid volume per cent. If pressure buildup took place very rapidly as compared to gravitational flow, the expan-

Dr. Harvey T. Kennedy is distinguished professor of petroleum engineering at Texas A. & M. College. He received his bachelor of chemistry from Cornell University in 1921, and his Ph.D. in physical chemistry from Johns Hopkins University in February 1928. For nearly 20 years he was chemist, section chief, and assistant chief of materials and production chemistry division, Gulf Research & Development Co., Pittsburgh. Here he worked with the development of specialties sold by Gulf, development of processes used in the oil and gas industry relating to well plugging, acid treatment, inhibition of corrosion, shooting wells, drilling fluids, treatment of formations, and other work.

Paper presented at meeting of Texas Petroleum Research Committee, Austin, Tex., April 1952.

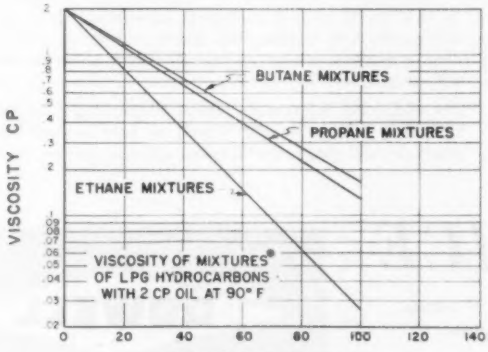

VISCOSITY CP
BUTANE MIXTURES
PROPANE MIXTURES
ETHANE MIXTURES
VISCOSITY OF MIXTURES® OF LPG HYDROCARBONS WITH 2 CP OIL AT 90° F
VOLUME PER CENT LPG

Fig. 4.

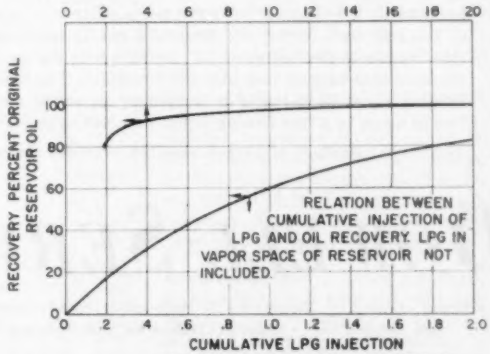
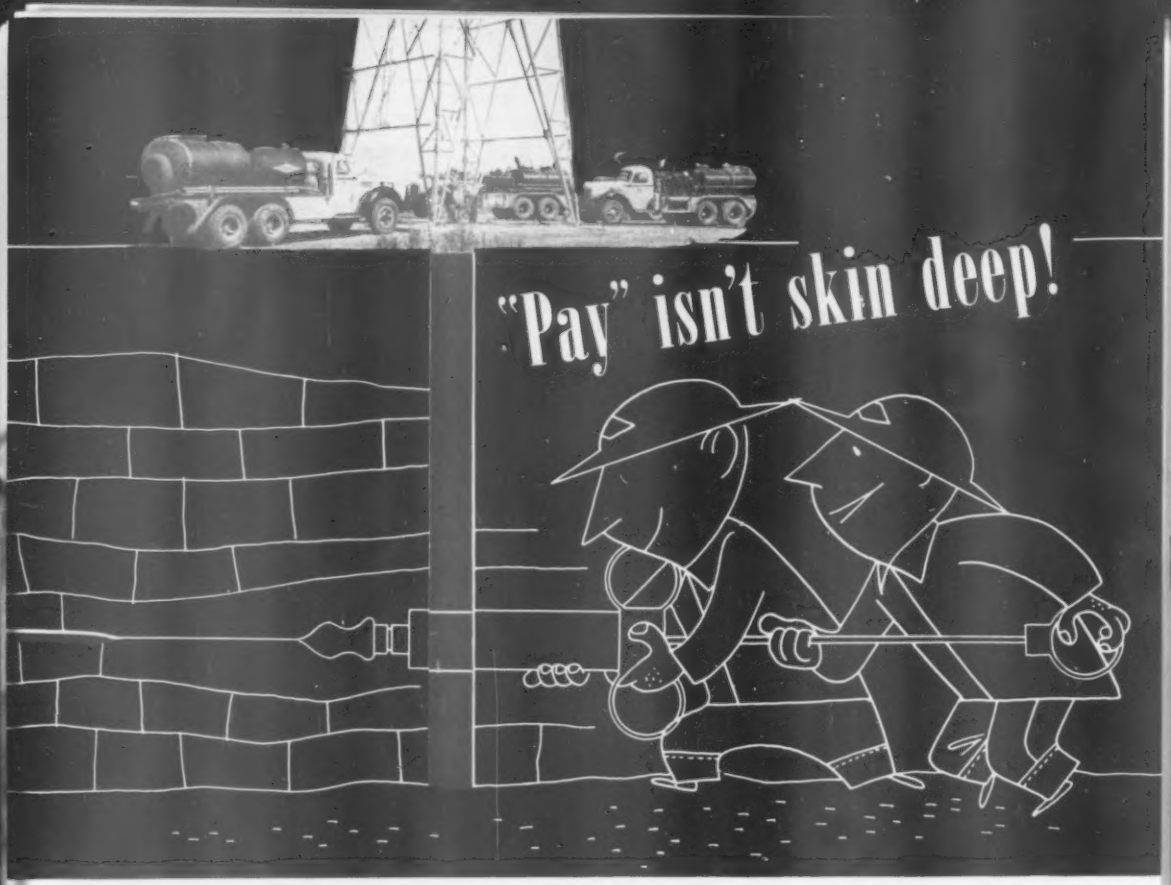

RECOVERY PERCENT ORIGINAL RESERVOIR OIL
RELATION BETWEEN CUMULATIVE INJECTION OF LPG AND OIL RECOVERY. LPG IN VAPOR SPACE OF RESERVOIR NOT INCLUDED.
CUMULATIVE LPG INJECTION BBL. PER BBL. ORIGINAL RESERVOIR OIL

Fig. 5.



DOWELL CHANNELING ACID is designed to open longer drainage channels—tap production far back from the well bore

Dowell Channeling Acid has been developed to permit acidizing of areas in pay formations far back from the well bore . . . reaching oil production that otherwise might be left untapped. Channeling Acid contains chemical agents designed to form a film on the face of the pay, temporarily blocking all but a few pores. Thus the bulk of the acid used during the treatment can be diverted into the few unblocked pores . . . forming long drainage channels that extend deep into the formation. The film-forming agent in the acid is temporary in action and breaks down to a free-flowing liquid in a few hours.

This recent product of Dowell research provides a new method of improving the producing characteristics of oil and gas wells. A new well completed in the McClosky formation was producing 2 barrels of oil and 10 barrels of water per day. A Channeling Acid treatment consisted of a small spearhead of regular acid to open up the formation, followed by 750 gallons of Channeling Acid and 2,000 gallons of regular acid. Three and a half months after treatment, production was 50 barrels of oil per day with only 1 barrel of water.

For additional information about Channeling Acid and the many other valuable Dowell oil field services and products, call the nearest Dowell office or station.

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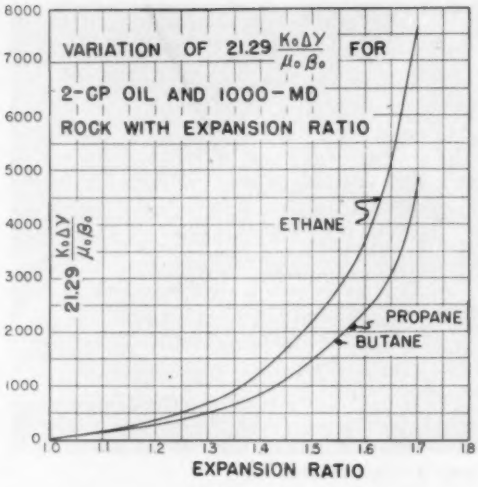

Fig. 6.

sion of the liquid phase would take place according to the relation:

$$V_e/V_o = 1/(1 - X)$$

where V_e and V_o are the expanded and original volumes of the reservoir liquid phase, and X is the volume fraction of L.P.G. in the liquid.

As the pressure of condensable hydrocarbon approaches its vapor pressure, only considerations of reservoir space would prevent the volume ratio from becoming infinite. On the other hand, if gravitational flow were effective in maintaining substantially constant liquid saturation in the reservoir, the fractional recovery of oil, R, would be represented by a similar equation:

$$R = 1/(1 - X)$$

It is assumed, of course, that the liquid flowing by gravity to the lower portion of the reservoir is recovered by the producing wells. In this idealized case, only considerations of excessive volumes of L.P.G. circulated per barrel of recovered oil prevent the recovery from reaching 100 per cent.

Fig. 4 shows the viscosity of liquid ethane, propane and normal butane at 90° F., obtained by extrapolating data obtained at lower temperatures.[2] The viscosities are shown at the right extremity of the lines. The lines themselves represent approximately[3] the viscosity of mixtures of these hydrocarbons with oil of the viscosity of 2 cp.

The viscosity of any mixture with an oil of higher or lower viscosity may be determined in a similar manner by drawing a straight line connecting its viscosity with the point representing the condensable hydrocarbon. Since the relation is logarithmic, the value for any mixture is substantially lower than would be expected on the basis of a simple law of mixtures. For example, the addition of equal volumes of 2-cp. oil and liquid ethane gives a mixture with a viscosity of only 0.24 cp., while comparable mixtures containing propane and butane have values of 0.5 cp. and 0.6 cp.

". . . only considerations of excessive volumes of L.P.G. . . . prevent recovery from reaching 100 per cent."

Fig. 5 shows the fractional recovery from an idealized reservoir as a function of the number of barrels of L.P.G. injected per barrel of oil present initially. It is assumed that the gravitational flow is rapid compared to the L.P.G. injection rate, so that the expanded oil is produced fast enough to prevent an increase in liquid saturation. The volume of L.P.G. in the vapor phase in the reservoir is normally small compared to that in the liquid phase, and has not been included. If the pore space available for gas saturation is known, it should be taken into account.

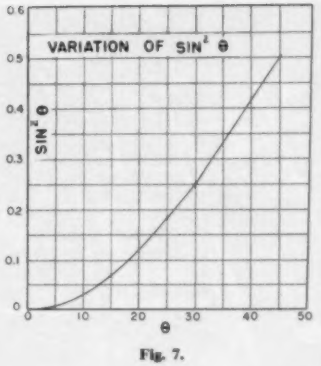

Fig. 7.

Fig. 5, as well as Figs. 2, 3, and 4 deals with equilibrium relations. Actually, of course, we are concerned with the rate at which the oil may move downstructure and be available for production through the producing wells. This calculation may be made by substituting in the proper values in Muskat's equation shown in Fig. 1.

In the equation (Fig. 1), K_o, $\Delta\gamma$, μ_o, and β_o all vary as the L.P.G. is injected and the pressure in the reservoir rises. The value of K_o depends on the nature of the rock, and varies over considerable limits. For purposes of illustration, data obtained by Osoba and others,[4] shown in Fig. 3 of their paper and reproduced in Table 1, will be used. These data are chosen because they cover the range of saturations involved in depleted solution gas-drive reservoirs, and because they apply specifically to drainage rates as required in this analysis. Values of $\Delta\gamma$ may be calculated from the law of mixtures for liquids and from handbook[5] values for condensable vapors; μ_o may be taken from Fig. 4 for 2-cp. oil, and $1/\beta_o$ from Fig. 3.

Fig. 6 shows the value of $21.29 \times \frac{K_o \Delta\gamma}{\mu_o \beta_o}$ as a function of the fractional increase in volume of oil, caused by the absorption and complete diffusion of ethane, propane and n-butane for a 1,000-md. rock. The values are tabulated in Table 1. Fig. 7 shows the value of $\sin^2 \Theta$ as a function of Θ.

Gravitational flow . . . For any degree of reservoir liquid expansion this may be calculated by multiplying the value of $\sin^2 \Theta$ from Fig. 7 by the appropriate value from Fig. 6. Thus, if the L.P.G. employed is propane, the in-

(Continued on page 69)

TABLE 1

		μ_o				$\Delta\gamma$			$21.29 \times \frac{K_o \Delta\gamma}{\mu_o \beta_o}$		
V_e/V_o	K_o md.	e	p	b†	$1/\beta_o$	e	p	b	e	p	b
1.0	0	2	2	2	1.0	.803	.803	.803	0	0	0
1.1	20	1.33	1.57	1.60	.91	.737	.767	.777	215	189.5	188.5
1.2	30	.954	1.27	1.32	.83	.686	.742	.757	384	311	305
1.3	45	.73	1.07	1.14	.77	.635	.721	.741	643	498	480
1.4	75	.575	.927	.991	.71	.608	.700	.725	1,210	865	840
1.5	125	.475	.815	.881	.67	.575	.686	.714	2,150	1,490	1,440
1.6	195	.391	.720	.791	.62	.549	.667	.705	3,650	2,380	2,320
1.7	*380	.329	.644	.719	.59	.523	.656	.695	7,580	4,870	4,620

*Extrapolated. †e, p, and b refer respectively to ethane, propane and n-butane.

AIR VIEW of the Texas City plant of Carbide & Carbon Chemicals Co.

PETROCHEM REPORT:

Carbide & Carbon Chemicals Co., Texas City

This firm currently spending $133,000,000 in two major expansion programs

by F. Lawrence Resen
Gulf Coast District Editor

A HUGE expansion program totaling upwards of $60,000,000 at Texas City and a second program involving more than $73,000,000 in facilities to be constructed at a nearby Texas Gulf Coast location marked Carbide and Carbon Chemicals Division's (Union Carbide & Carbon Corp.) continuous stepping out in the petrochemical field.

The two major programs, due for completions in the next 2 years, will involve seven different facilities which will provide new processes for Carbide or additional facilities for existing processes at Texas City. Initial construction was begun in a polyethylene plastic resin unit due to go on stream in early 1953. Coupled with this facility will be an expansion of existing gas-separation equipment to provide raw materials for the resin production.

The ventures will add to the multi-million dollar plant at Texas City which first went on stream in May 1941, and which has since experienced continual expansion to where a wide variety of petrochemicals are now produced in considerable quantities.

COOLING AND SCRUBBING system, gas-separation unit, at Carbide's Texas City plant.

Acetylene . . . One of the newest additions to Carbide's Texas City plant prior to current construction was the introduction of a radically different chemical process for the production of acetylene from methane and oxygen.

Prior to use of the partial oxidation process, all acetylene in the country was produced either by means of electric arc processes or with calcium carbide as a starting base. Carbide, however, utilized a principle previously used by the Germans during World War II to take advantage of both the availability of large quantities of natural gas and the processing units which could use acetylene to synthesize a variety of finished or intermediate chemicals.

Methane, obtained from natural gas, and oxygen are reacted at high tem-

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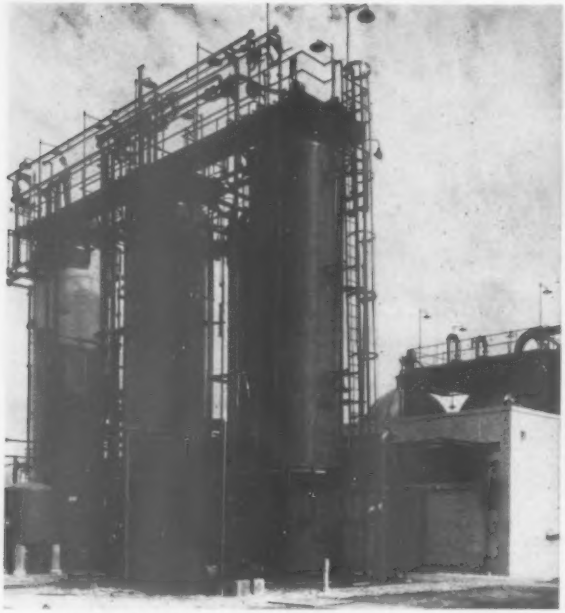
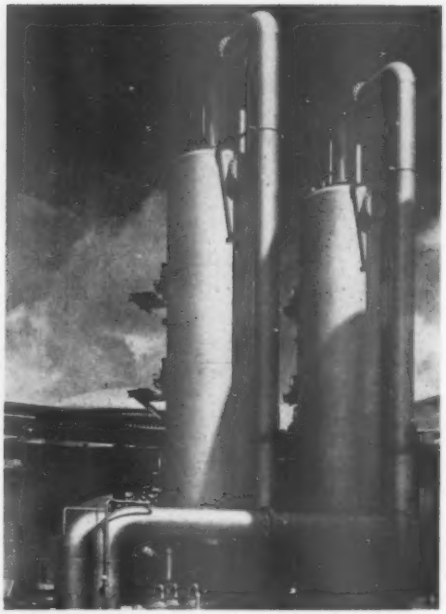


PROCESSING EQUIPMENT at the Texas City plant. Synthetic alcohol, ethyl ether, acetone, and acetic acid are produced in large quantities.



GAS-SEPARATION UNIT equipment located in Carbide's Gulf Coast plant.

peratures to produce a gas mixture containing essentially acetylene, with smaller percentages of carbon dioxide, methyl acetylene, diacetylene, vinyl acetylene and other residual gases. The mixture of gases then passes through a purification unit where acetylene is separated and purified and then used in the manufacture of vinylite resins.

The process represents a natural outgrowth of the company's needs at Texas City, where the acetylene is used completely—primarily for the production of the resin intermediates, vinyl chloride and vinyl acetate—in synthesis processes. The availability of both methane and oxygen at the plant made the process all the more attractive in the integration of over-all plant facilities.

Acetylene is a compound similar to ethylene in many ways. It is the first member of the acetylenic series as ethylene is the initial member of the olefin series. Both compounds are unsaturated and both have but two carbon atoms, with acetylene having two less hydrogen atoms than ethylene. Both are gaseous, highly inflammable and highly reactive compounds, but most important of all they both provide building blocks for the synthesis of numerous organic compounds. As would be expected, some compounds may be made using either ethylene or acetylene as the base starting material but in other instances either of the compounds is the exclusive starting component.

Vinyl Chloride

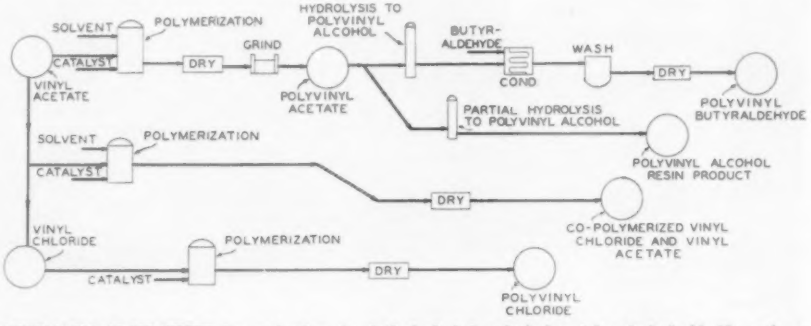
Vinyl chloride may be prepared by mixing gaseous acetylene and hydrogen chloride through a reaction chamber packed with highly activated charcoal or silica gel impregnated with a solution containing 20 per cent calcium chloride, 10 per cent barium chloride and 1 per cent mercuric or mercurous chloride, with a temperature maintained at 200° C.

$$HC{\equiv}CH + HCl \xrightarrow[200^{\circ}]{HgCl_2 \text{ impreg. charcoal}} CH_2{=}CHCl$$

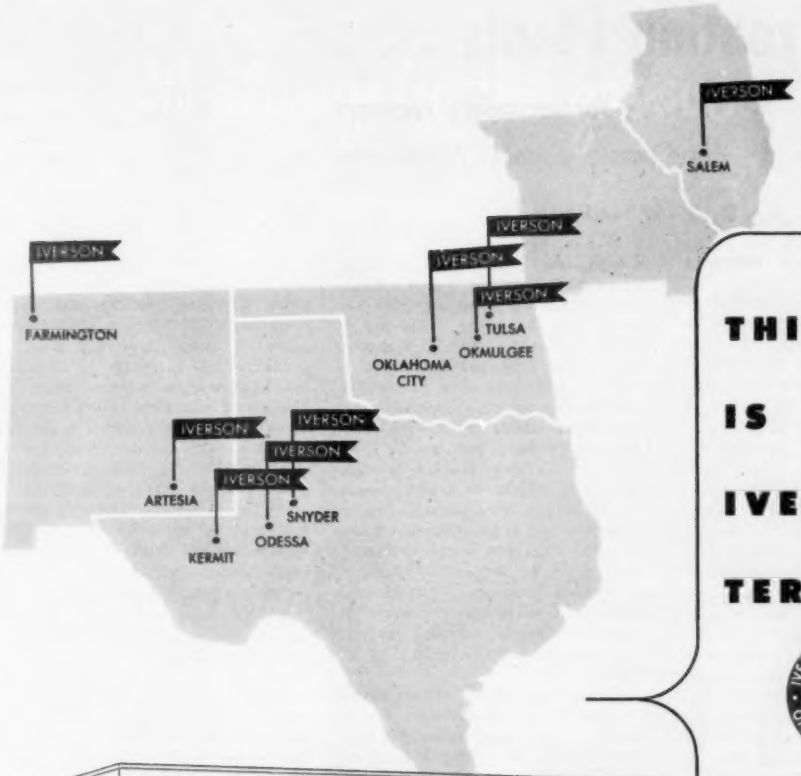
The final vinyl chloride is then polymerized to a resinous product.

Similarly, acetylene is used as the starter for the production of the acetate. Vinyl acetate is formed by the addition of acetylene to acetic acid in the presence of mercuric salts.

(Continued on page 82)

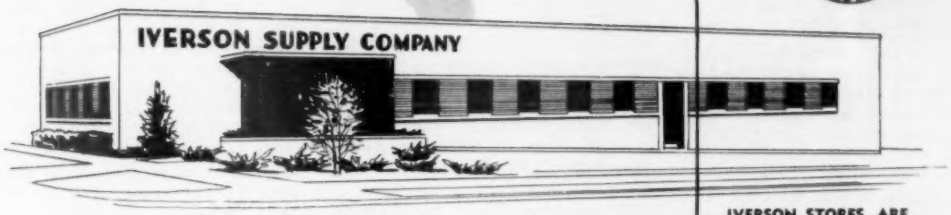


SCHEMATIC FLOW SHEET for production of polyvinyl alcohol, polyvinyl acetal, polyvinyl chloride, and copolymer of vinyl chloride-vinyl acetate.



THIS IS IVERSON TERRITORY

IVERSON SUPPLY CO. OIL WELL SUPPLIES



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OFFICES: MIDLAND TEXAS

Water-Treating Plants . . .

. . . for secondary recovery and waste disposal (California)

by R. T. Wheeler*

PART 2—CORROSION ASPECTS

IN general, it can be stated that the higher the salinity of the brine, the higher the corrosion rate, and corrosion is the chief cause of expensive maintenance, replacement, and shutdown time.

In designing a brine-treating plant it should be kept in mind that the equipment is to last for the life of the flood, or, if a disposal project, for the life of the field. The petroleum engineer, in his original calculations, will estimate the cost of a treating plant, amortize the investment over the expected length of the flood, or a reasonable number of years. He will also estimate the cost to treat and inject a barrel of water. Unusually high maintenance and replacement costs are not figured into the proposal, and must ultimately come out of expected profit. Long shutdown periods caused by corrosion lengthen the flood life and thereby materially reduce the profits.

The factors, coupled with high salinity, that cause severe corrosion are dissolved oxygen, hydrogen sulfide, dissimilar metals, and high velocities.

Dissolved oxygen is not present in waters that are produced from oil-bearing zones, but is absorbed into the water usually in skim ponds or while going through other surface treatments.

*Union Oil Co. of California. Second part of paper presented at American Petroleum Institute, Pacific Coast District, Division of Production, Los Angeles.

Probably the easiest way of solving this problem is by the use of a closed system which keeps the air from contacting with the water. There are instances, however, where this method cannot be applied, and mechanical or chemical deaeration can be used to eliminate this source of trouble.

Hydrogen sulfide is often present in California brines, and usually gives rise to a difficult treating problem. Eliminating sulfides is a costly operation as oxygen must be added either by means of air or in a chemical oxidizing agent. If oxygen is added, then the excess must be removed to eliminate a corrosion problem. A bacteriacide should also be added to prevent the anaerobic sulfate reducing bacteria from converting more sulfate to hydrogen sulfide.

Dissimilar metals in contact can be a serious source of corrosion. For instance, a steel pipe connected to a bronze pump, pressuring a brine water of 18,000 p.p.m. of chlorine ion, will last about a month. Insulating the dissimilar metals will prevent this type of corrosion by blocking the flow of electrons through the metal. Some of the methods commonly used are insulating gaskets, plastic pipe, or rubber hose separating the two metals.

High velocities cause corrosion attack by sweeping away the corrosion products and leaving the bare surface exposed for further attack. Products formed in the corrosion reaction protect the metal from further attack, depending on the metal involved. This type of corrosion can be minimized by installing ample capacity of piping.

Corrosion Mitigation by Initial Design

Considerable down time and expensive maintenance can be avoided by proper engineering and design of the water plant. The correct choice of filters, injection pumps, storage facilities, valves, pipe fittings, and pipe will pay out in a short period of time.

Filter equipment is expensive and any corrosion would cause costly repairs. Therefore, in corrosive conditions, it is advisable to install a unit made of monel, stainless steel, or plastic. Monel has excellent corrosion-resistant properties in brine waters, and has proved very satisfactory in service. Stainless steel, which comes in a variety of grades, will stand up very well. However, considerable thought should be given to insure that this metal will remain passive in the service encountered. Plastic as yet has been used very little in this service, but will probably be used more in the future.

The majority of the companies are using horizontal slow-speed triplex injection pumps with bronze fluid ends, for protection against corrosion. Bronze fluid ends are reported to resist corrosion in severe service, and coupled with porcelain plungers, this type of pump should give good service for the life of the flood, with minor maintenance. Stainless-steel plungers are in wide use at the present time. However, in some cases, the packing has scored the plungers, necessitating having them faced with a harder metal.

Raw water and clean water storage can be handled in wooden tanks, concrete pits, or plastic-coated steel tanks, which give good service against corrosion attack.

Valves are one of the major items in a treating plant. Sticking or leaking valves require considerable maintenance which can be eliminated if a

LIST OF CALIFORNIA PLANTS, WITH DATA FOR TYPES OF OIL REMOVAL, PUMPS, FILTERS, WATER CHARACTER

Project	Oil removal	Injection pump		Filter—	pH	Cl	HCO_3	SO_4
		Type used	Metal in fluid end					
1	Skimming sump	Positive displacement	Cast iron	Sand	7.3	21,800	293	Trace
2	Skimming tank	Duplex	Bronze	Plate and frame	8.3	8,200	226	33
3	Skimming tank	2-stage centrifugal	Bronze	Plate and frame	7.4	14,100	305	71
4	Skimming tank		Steel	Diatomaceous earth	7.6	16,200	760	320
5	Skimming pond	Positive displacement	Steel	None				
6	Skimming pond	Positive displacement	Bronze	Sand filter				
7	Skimming tank	Positive displacement	Monel	Diatomaceous earth		117	842	
8	Skimming pond	Centrifugal	Bronze	Diatomaceous earth	7.5	7,216	537	273
9	Skimming pond	Positive displacement	Steel	Sand filter				
10	Skimming tank	Positive displacement	Bronze	Sand filter				
11	Skimming tank	Positive displacement	Steel	Diatomaceous earth				
12	Flotation	Positive displacement	Bronze	Sand filter and diatomaceous earth	7.4	17,892	1,008	5
13	Skimming pond	Positive displacement	Steel	Diatomaceous earth	7.5	727	494	6
14	Skimming pond	Positive displacement	Bronze	Diatomaceous earth	7.1	21,240	291	144
15	Excelsior box	Positive displacement	Bronze	Diatomaceous earth	6.8	21,691	347	0
16	Skimming sump	Positive displacement	Steel	None				
17	None	Positive displacement	Steel	Diatomaceous earth		5,858	2,537	50
18	Skimming pond	Positive displacement	Iron	None		4,246	1,415	76

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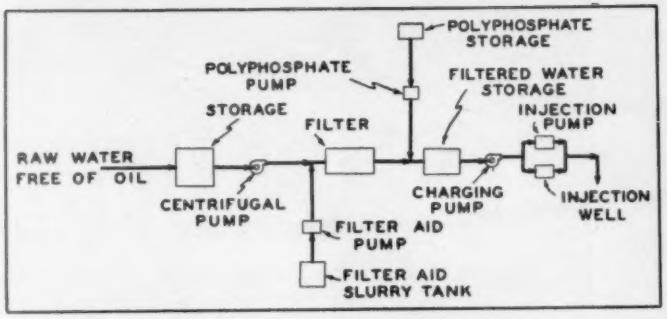

Schematic flow diagram for 3,000-bbl. per day injection plant.

suitable type is installed at the onset. Diaphragm valves have proved to be very successful in several cases as all working parts are protected from the corrosive water by a neoprene diaphragm. In some applications, three-way plug valves have proved successful in minimizing the time required to backwash. However, in corrosive water, they freeze up making them inoperative.

In choosing pipe fittings, welded flange connections will give longer service than screwed fittings, because replacements can be made rapidly with little or no loss in down time. Corrosion attack is more severe in threaded fittings because of concentration cell attack in excess threads that are not made up. Leaking in a screwed joint is almost impossible to stop unless the entire fitting is replaced.

If it is determined that the brine water is corrosive, many dollars can be saved by the use of seamless pipe. Lap and continuous weld pipe corrode along weld, limiting length of service.

Cost of Operating 3,000-Bbl. Plant

The following example will set forth the initial plant investment for an average water-treating problem for California.

Initial Plant Investment

We will assume there is 3,000 bbl. of water per day to treat and to inject at 1,500 psi., and we wish to filter this water, which contains 100 p.p.m. of filterable solids. This brine also requires an algaecide, and is scale forming. In these cost studies assume again that the oil has been mostly removed by skim ponds or similar equipment.

In choosing the size of a filter, it is approximately correct to assume that the maximum capacity will be 1 gal. per minute per square foot of filter area, and the normal operating condition will be close to one-half of this amount. On the basis of this figure, a 200-sq.-ft. filter would be required.

The entire cost of a treating plant, including the injection facilities, would cost approximately $47,700 (see Table 1 for itemization). To double the volume of water treated would cost approximately one-third more. A schematic flow diagram for this plant is shown in an accompanying illustration.

Operating cost data are difficult to obtain. Table 2 itemizes the power, chemical, and labor costs necessary to operate a plant treating 3,000 bbl. of brine water a day. The assumptions used for estimating the cost data are the same as previously stated.

It is interesting to note that for a plant using this method of treatment, the chemical and power costs 0.7 cent per barrel, independent of the volume of water treated.

TABLE 1—INITIAL INVESTMENT FOR A WATER-TREATING PLANT (3,000-BBL. PER DAY)

Equipment—	Cost
Filter (200 sq. ft.) (Monel)	$10,500
Filter aid tank	700
Precoat tank	400
Valves	1,500
Chlorination equipment	2,000
Meters	600
Phosphate injecting equipment	400
Two centrifugal charging pumps	1,025
Clean water-storage tank, including protective coating	1,000
Two triplex pumps with engines	17,586
Electrical equipment	2,000
Pipe, pipe fittings, concrete	3,000
Paint	2,000
Labor	5,000
Total	$47,711

TABLE 2—OPERATING COSTS PER DAY AND PER BARREL FOR A 3,000-BBL. PER DAY WATER-TREATING PLANT

Electrical costs at $0.01 per kw.-hr.:	
Filter charging pump, 7½ hp.	$1.35
Injection charging pump, 1½ hp.	.24
Mixer on slurry tank, ⅛ hp.	.06
Polyphosphate pump, ¼ hp.	.05
Chlorination heater	.20
Lights	.05
Total	$1.95
Gas fuel for injection engines	$7.05
Oil for injection engines	.50
Maintenance for injection engines	2.50
40 lb. of chlorine at $0.0475 per lb.	1.90
5.4 lb. polyphosphate at $0.17 per lb.	.92
100 p.p.m. of Filteraid at $0.0475 per lb.	4.75
Precoat	.40
Total	$19.97
2 hours labor per day at $2.50 per hr.	5.00
Operating cost, per day	$24.27
Operating costs, excluding labor and maintenance, cents per barrel	= 0.665
Operating costs, excluding maintenance only, cents per barrel	= 0.816

Oil Recovery by L.P.G. Injection

(Continued from page 61)

clination of the strata is 20°, and the expansion of the oil is 1.2, it may be calculated that the production of stock-tank oil from each acre of gas-oil contact area will be 36.4 bbl. per day. It is seen that the production rises rapidly with both the slope of the strata and with the ratio x_o/x_o. Thus, for an inclination of 30° and a value for x_o/x_o of 1.5, the production by gravity flow may be calculated as 600 bbl. per day, while for 45° and 1.5, 1,100 bbl. per day would be produced.

It should be made clear that the value of x_o/x_o is not within the direct control of the operator of the injection program. The meaning of the above calculations may be summarized by the statement that if L.P.G. is injected steadily at the rate calculated to give the estimated production, the required values of x_o/x_o are those plotted. It is seen that high and profitable rates of oil production are predicted for reservoirs of moderate slopes.

It should be noted that the flow of oil-L.P.G. mixtures into the producing wells is not limited by the local rate of gravitational flow. Thus, once oil has moved downstructure to the level of these wells, the full pressure in the reservoir is available to overcome the formation resistance around the wells.

References

1. Morris Muskat, Physical Problems of Oil Production; McGraw-Hill Book Co., 1949, p. 487.
2. Selected Values of Properties of Hydrocarbons, Bureau of Standards Circular C, 461, p. 109.
3. Emil Hatschek, The Viscosity of Liquids; D. Van Nostrand Co., 1928, pp. 136-38.
4. J. S. Osoba, J. G. Richardson, J. K. Kerver, J. A. Hafford, and P. M. Blair, Laboratory Measurements of Relative Permeability; Trans. A.I.M.E. 1951, 192, p. 50.
5. Natural Gasoline Supply Mens Association, Technical Manual, 1946 fifth edition, p. 86.

First supply store, Clarendon, Pa.—1867.

One of newer Jarecki International supply stores, Odessa, Tex.

Jarecki Progress Built on Service

Century-old supply firm, predating Drake discovery, begins second hundred years

WHEN Col. E. L. Drake in 1859 near Titusville, Pa., completed the first well drilled for oil, the flow was controlled by brass fittings made by Jarecki.

Thus before Drake and associates could tap a new natural resource whose output has largely directed the course of world economic trends for more than 90 years, there had to be an established manufacturing and supply industry of which Jarecki was an important part.

The initial Jarecki organization, now the Jarecki International Division of H. K. Porter Company, Inc., Dallas, which this year is celebrating its 100th anniversary, had been preparing for an event such as the Drake well since 1852. In that year two young brothers, Henry and Charles Jarecki, who previously had come to this country from Posen, Germany, started a small machine shop at Erie, Pa., and began manufacturing brass products including fittings and valves. Among their facilities were crude lathes and a melting furnace.

Their operations were still small when the oil business was started but the two brothers, operating under the name of Henry Jarecki & Co., had already established their firm's principle —service to customers—which continues to this day and around which the one-room concern was later to be expanded into a major enterprise.

The brothers obtained a background of what is needed in oil drilling by furnishing some of the early equipment used in drilling salt wells in Pennsylvania. This business was sporadic and in those early years there was more to discourage the brothers than there was to encourage them to carry on. But they weathered all misfortune and had a going concern when the start of the oil business brought major changes in their current operations and future objectives.

Served Oil Industry

The Jarecki output was quickly shifted to the rapidly expanding needs not only of the early drilling but also production and transportation. The brothers found out what tools were required by this new oil business and then, within the limits of their shop facilities, made them available. The wrench now on exhibit at the Drake Museum at Titusville was an early Jarecki invention.

Shortly more space was required and a new factory covering an entire block was built at Erie.

The Jarecki management after a few

First major plant of the Jarecki Manufacturing Co. located at Erie, Pa.

CHARLES L. WHITE
General Manager

F. E. SUDER
Sales Manager

FRANK E. SWAIN
Assistant to General Manager

The management . . .

CHARLES L. WHITE, who is general manager of the Jarecki International division, joined the organization in 1949 following more than 20 years' experience in the manufacture and sales of products for the oil industry. He joined Bridgeport Machine Co. in 1926 and in 1929 became affiliated with Williamsport Wire Rope Co. From 1936 to 1945 he was connected with the wire-product division of Bethelehem Steel Co. He then was in charge of oil-country and industrial wire rope for R. G. Le Tourneau, Inc.

F. E. Suder, sales manager, joined Jarecki in 1950 after having had wide experience in supply-company activities throughout the United States. He was with Ideco in various capacities from 1930 to 1950.

Frank E. Swain, assistant to the general manager, joined Jarecki in 1951 after 9 years with Ideco.

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years realized that it was not enough to manufacture certain products and equipment used in the oil fields and plants, and out of that realization in 1867 grew its first supply store, located at Clarendon, Pa.

The store, centrally located, was designed to supply operators with a complete line of products including those manufactured by companies other than Jarecki. It was a success from the start and others were built as the Pennsylvania operations grew. When the oil industry moved west through Ohio and the Middle West and then into the Southwest, Jarecki products and supply stores went with it.

Expand Manufacturing

Manufacturing operations were also added to in Erie. An iron foundry was built in 1889. In the early twenties the concern, by then known as Jarecki Manufacturing Co., acquired one of the largest munition plants of World War I, located at Erie and converted it to Jarecki operations. This plant was operated until 1951. The company was one of the first to use natural gas in the area for plant fuel and lighting.

With the acquisition of the munitions plant, Jarecki became one of the country's large producers of cast iron and malleable iron with a large output of fittings, valves, and a number of specialties usually designed for use by the oil industry.

Until the sale in 1949 to the H. K. Porter interests, the Jarecki operations were family owned and managed. Charles Jarecki became chairman of the board of the company in 1884, succeeding his brother Henry. Albert Jarecki, son of Henry, was appointed head of the company in 1901 when Charles Jarecki died. Alex Jarecki, son of Charles Jarecki, succeeded Albert in 1915, and he in turn was succeeded by his brother Robert in 1941. Robert Jarecki was president until 1949.

Jarecki activities have been built around well-trained personnel. Employment with the concern from 24 to more than 40 years is not uncommon among employes in all phases of activity.

Those associated with the varied activities of the supply operations include some who have spent a lifetime in the oil country, starting in the eastern areas and continuing to oil centers in Texas, Oklahoma, and other points. They have a working knowledge of the

H. K. Porter Company, Inc., management . . .

T. M. EVANS
President, H. K. Porter Company, Inc.

C. R. DOBSON
Exec. Vice Pres., H. K. Porter Company, Inc.

The Oil Industry's

100 YEARS

A Division of
H. E. PORTER COMPANY, INC.

1852 - 1952

It was 1852, seven years before Colonel Drake discovered the first producing oil well in America, that Jarecki was founded. In 1867 Jarecki opened their first oil well supply store in Titusville, Pennsylvania.

One hundred years later, in March, 1952, Jarecki opened their newest supply store at Rule, Haskell County, Texas. Through the entire life of the oil industry Jarecki has continuously served the needs of this great industry.

FIRST *Source of Supply*

We can't imagine what the next hundred years will bring in the way of new equipment and supply store services. But this we do know: as changes occur in the future, as they have in the past, the Jarecki International organization will continue to bring you the best service and the best products on the market.

One hundred years experience is at your command. Call your nearest J-I store.

JARECKI INTERNATIONAL SUPPLY DIVISION
H. K. PORTER COMPANY, INC.
General Sales Office Dallas 1, Texas Atlantic Building
OTHER H. K. PORTER COMPANY, INC., DIVISIONS SERVING DIVERSIFIED INDUSTRIES:
American-Fort Pitt Spring Division; Hinderliter Tool Company Division; Buffalo Steel Division; Connors Steel Company; Delta-Star Electric Company; Quaker Rubber Corporation

CARL ANGSTADT
District manager, Eastland, 40 years service.

C. O. CARPENTER
Salesman, Okla. City office, 40 years service.

J. F. CONLEY
Mgr., Wichita Falls, Tex., 37 years service.

Veterans . . . and a typical career

JARECKI store managers and salesmen are known throughout the oil country of the Southwest and other areas and they have played important parts in the development of new communities. The 40-year career of Carl Angstadt is an example. In 1918 he was transferred from Augusta, Kans., to Eastland, Tex., to take over a new store. Until March this year he lived in the apartment above the store and reared a family there, his services always being available day or night to the oil industry of that section. Active in community affairs, he is now manager for the company for the West Central Texas area with headquarters in Eastland. The view at left shows inside of the store in the twenties. Angstadt is standing (middle) with customers and employes of the store.

products supplied by hundreds of manufacturers and their uses in every phase of field, plant, and pipe-line activity. Jarecki's reputation for service has been built around these men.

Becomes Porter Division

A new period in the life of the Jarecki organization started in July 1949 when the company was purchased by the H. K. Porter interests. The first change was to make Jarecki solely a supply organization. The manufacturing facilities were either disposed of or consolidated with other divisions of the Porter organization.

The Porter organization also has a long history, having started in Pennsylvania in 1866 as a manufacturer of locomotives. Later its operations were more diversified.

Important expansion of the parent company has taken place over the past decade and it now consists of the following subsidiaries and divisions in addition to the Jarecki International division:

American-Fort Pitt Spring Division, McKees Rocks, Pa.

Buffalo Steel Division, Tonawanda, N. Y.

Connors Steel Co., Birmingham.

Delta-Star Electric Co., Chicago.

Hinderliter Tool Co. Division, Tulsa.

Quaker Rubber Corp., Philadelphia.

These companies now have 3,000 employes and manufacture and distribute numerous products at plants which have in excess of 600,000 sq. ft. of space. More than $3,000,000 has been spent in modernizing the operations of these divisions and further expansion and modernization have been projected.

Greater opportunities for serving the oil industry were assured in March 1951 when H. K. Porter Company, Inc., acquired the supply stores of the Ideco Division of Dresser Equipment Co. Later some Jarecki and Ideco stores were consolidated and stores to serve new areas have been built over the past 2 years.

With this acquisition, the name was changed from Jarecki Manufacturing Co. to the Jarecki International Supply Division, H. K. Porter Company, Inc. Headquarters are located in the Atlantic Building, Dallas. The company currently has 13 stores located in 4 states as follows:

Texas: Eastland, Houston, Graham, Kilgore, Odessa, Snyder, Wichita Falls, Rule, and Winters.

Oklahoma: Seminole and Oklahoma City.

New Mexico: Hobbs.

Louisiana: Shreveport.

In addition to Dallas, sales offices are located in Fort Worth and Midland, Tex., and Tulsa. Jarecki International sales offices and supply stores are now located in areas where approximately 70 per cent of the drilling in the United States takes place. Stores will be added and the sales organizations will be expanded as required to adequately serve the industry.

T. M. Evans, president of H. K. Porter Company, Inc., Pittsburgh, and majority shareholder of the company,

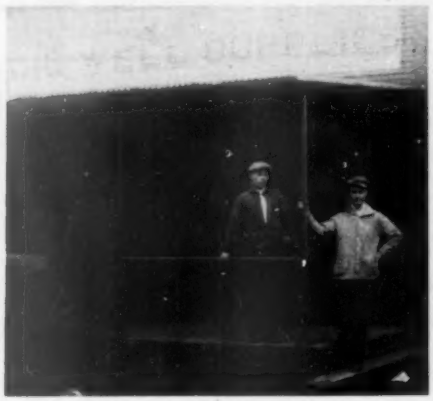
Today . . .

has been active in industrial operations since graduation from Yale University. He takes an active part in the direction of the company's subsidiary companies and divisions covering a variety of industrial activities.

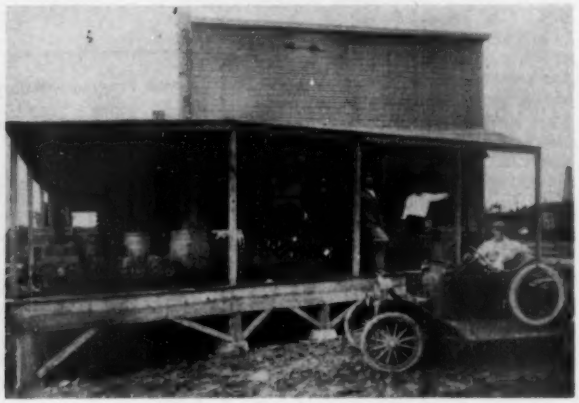
C. R. Dobson, executive vice president of H. K. Porter Company, Inc., became interested in manufacturing and related activities as soon as he graduated from Carnegie Institute of Technology. He was for 28 years connected with the Jones & Laughlin Steel Corp. He is in direct charge of all the Porter operations.

Snyder, Tex., Jarecki International store serving vast Scurry County-Canyon Reef area.

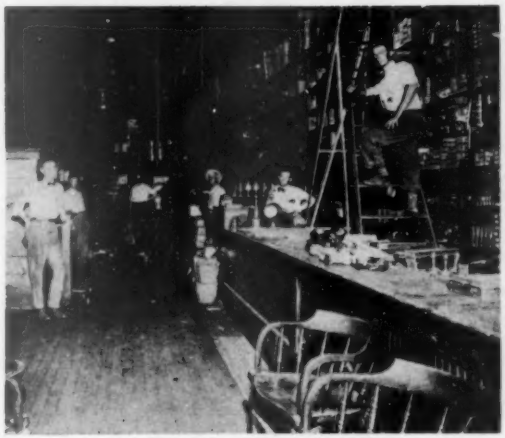
And Yesterday . . .



Kiefer, Okla., store, early photo.



This is a view of Borger, Tex., store in 1926.



Supply center at Cushing, Okla., 1913.

Interior view of store at Tulsa, 1912.

How to Increase Drilling-Line Service—2

. . . Frequency of Moves, Cuts; Planned Programs

by J. N. Kemple*

IDEALLY (uniform wear), a drilling line would be in constant motion through the system at a rate of movement which would vary with changes in the drilling cycle so that the rate of movement would always be in proportion to the rate of wear. New line would be fed into the system at the dead end and worn rope would be cut from the drum end. This, of course, cannot actually be accomplished. The line can only be moved at intervals. However, the same ratio of ton-miles of wear to feet moved can be maintained. Therefore, just what interval of movement to choose becomes an economic consideration.

In addition to moving the line at the proper rate so as to distribute the wear, the position of the line at the dead sheave must also be shifted at least a short distance and at rather frequent intervals to prevent the possibility of breakage from fatigue at that point. How often the position of the dead line must be shifted is dependent upon sheave and rope diameters, hook loads, and the type of formation being drilled. Moving frequencies at the dead-line sheave of from 200 to 1,000 ton-miles have all been used safely with the larger sheave and rope diameters, lighter loads and lesser amounts of vibration favoring less frequent moves.

It would be ideal if the frequency of moving the line for the distribution of wear and the frequency at which the line must be moved over the dead line sheave to prevent fatigue breakage were the same. However, the position of the line on the dead line sheave can be changed in approximately 15 minutes' time by merely adding more line to the system at the tiedown, but the points of wear can be changed only by moving the line through the system and cutting a length from the drum end. This requires about an hour on the average. Therefore, it is seldom economical to make cuts from the drum end as often as the line must be shifted over the dead-line sheave.

At an average of roughly $40 an hour for drilling-rig time, no cut should be made in the line until it will save at least a like amount in line service. For this reason, cuts should seldom be less than 40 ft. or more than 125 ft. in length. When the line is moved over the dead-line sheave, therefore, normal procedure is to move it an amount which is in proportion to the moving rate and to choose a cutting frequency which is the proper multiple of the frequency of movement over the dead sheave so as to provide uniform cuts of approximately the desired length. If this method is followed, when cuts are made, it is simply a matter of removing the extra line which has accumulated on the drum due to the moving.

Summary of Desired Method

These, then, are the quantities which must be determined in order to formulate a moving and cutting program: The moving rate, the dead line moving frequency, and the length, and, therefore, frequency of cut. Average ranges for these values as used on a number of trial installations with most common diameters of drilling lines used in California fields are as follows:

Line diameter (in.)	Dead-line moving freq. (ton-miles)	Moving rate (ton-miles per foot)	Length to cut (ft.)
1	200- 500	5- 9	30- 75
1¼	400- 700	8-12	40-100
1¼	700-1,000	14-20	50-125

The moving rates listed above ap-

Actual Program—Rotary Drilling Line—Ventura Field, California.

Drilling line used 1¼-in. diameter 3,500-ft. Seale Patent Plot, Wire Rope Core:

Moving rate . . . . . 20 ton-miles per foot
Moving frequency . . . . . 800 ton-miles

Length to move then is . . . . . 800 ÷ 20 or 40 ft.

Note . . . This 40 ft. will be moved every time 800 ton-miles of wire-line service has been accumulated.

Number of Trips to Equal 800 Ton-Miles.

Knowing the weight of the traveling block assembly, the drill pipe and the drill collars, the number of round trips to any depths required to accumulate this 800 ton-miles can be calculated from the A.P.I. ton-mile chart.[2] In this case, the weight of the block assembly and buoyed weight of the drill collars was approximately 30,000 lb., the number of round trips required to accumulate 800 ton-miles at each depth range were:

Depth range (ft.)	Round trips*	Depth range (ft.)	Round trips
0-1,000	131	6,000- 7,000	6
1,000-2,000	40	7,000- 8,000	5
2,000-3,000	20	8,000- 9,000	4
3,000-4,000	13	9,000-10,000	3
4,000-5,000	10	10,000-11,000	3
5,000-6,000	8	11,000-12,000	2

*Note that the number of trips required for each move at the shallower depths is so large as to be practically useless for the purpose of actual determination of when to move, since only a very few trips are actually made at the shallower depths. In this case, it is known that about 800 ton-miles were accumulated in drilling to 6,000 ft.

Final program . . . This was established as follows:

Move the line 40 ft. when a depth of 6,000 ft. is reached. Thereafter, move as follows:

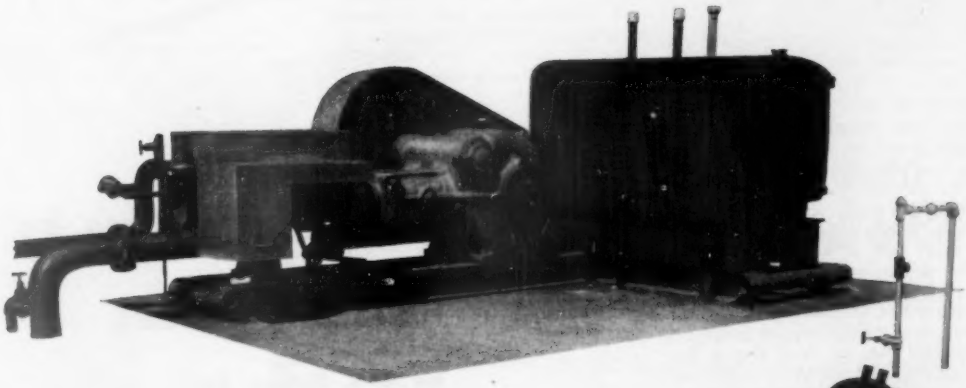
6,000- 7,000 ft. — Move 40 ft. every six round trips
7,000- 8,000 ft. — Move 40 ft. every five round trips
8,000- 9,000 ft. — Move 40 ft. every four round trips
9,000-10,000 ft. — Move 40 ft. every three round trips
10,000-11,000 ft. — Move 40 ft. every three round trips
11,000-12,000 ft. — Move 40 ft. every two round trips

Cutting . . . It was decided to cut the line in 120-ft. lengths. Therefore, it was specified that the line be cut every third move.

*Manager, Wire Rope & Electrical Products, Columbia-Geneva Steel Division, United States Steel Co. Portion of paper presented at spring meeting, Pacific Coast District, Division of Production, American Petroleum Institute, Los Angeles.

Here's Why!

ALLIS-CHALMERS ENGINES



On Your Pipe Line Pumps Will Save You . . . $

Allis-Chalmers Engines deliver maximum power at moderate speeds—*reduces wear.* Pressure Lubrication to all internal parts at any speed—*reduces wear.* Heavy Blocks keep parts in proper alignment—*reduces wear.* Heavy Crank Shafts, Rods and Main Bearings—*reduces wear.* Ample Cooling—*reduces wear.* Mass production keeps parts *prices low.* Factory-fit Motor Kits easy to install—*keeps maintenance costs low.* Removable Cylinder Sleeves—*lowers maintenance costs.* Repairs can be made by any ordinary mechanic on the location—*keeps maintenance low.* Mass production keeps FIRST COST low.

COMPARE

1. Allis-Chalmers Quality
2. Allis-Chalmers First Cost
3. Allis-Chalmers Parts Cost

With those of any other engine.

FRED E. Cooper, Inc.

P. O. BOX 1890 TULSA, OKLA

Houston, Odessa, Los Angeles

ply only to drilling lines at least twice the minimum length.

Devising a sound, workable moving and cutting program for any given set of conditions becomes relatively simple once the moving rate and moving interval have been selected.

Although not essential, it is easier to move the line over the dead-line sheave uniformly. To determine how much to move, simply divide the dead line moving efficiency in ton-miles by the moving rate. If, for example, a moving frequency of 500 ton-miles and a moving rate of 20 ton-miles per foot were used, the line would simply be moved 25 ft. every time 500 ton-miles of line service had accumulated.

It is also desirable to cut uniform lengths from the drum end but the length of cut must be in proportion to the moving rate. If, again, a 20-ton-mile per foot moving rate is used, all cuts made should be one-twentieth as many feet in length as the ton-miles service accumulated since the previous cut. As previously stated, it is always best to select a length of cut which is a multiple of the length of movement over the dead sheave. For example, if 25-ft. moves are made, cuts might be 75 ft. long. When this is done, cutting becomes simply a matter of removing the excess length of line which has accumulated on the drum due to moving.

Having all the required information, all that remains to be done to install a moving and cutting program is to put the data in a form the man on the rig can understand and follow.

Moving and cutting programs may be presented in many forms but perhaps the simplest and most universally used is to specify the amount to move and the number of ton-miles for each move. See accompanying example of an actual program in detail as it applied to a drilling rig in Ventura field.

Benefits of Program

Q. . . . How much does such an engineered moving and cutting program save as compared with haphazard methods? (A survey by the American Association of Oilwell Drilling Contractors revealed that the average service reported for a 1¼-in. line was only 6½ ton-miles per foot.)

A. . . . The service for the line in the above example was over 11. This is an increase of nearly 80 per cent. Moreover, the cost of moving and cutting according to this program was no greater than with the previous method involving only visual inspection. The savings are made possible not by an increased number of moves or cuts but by moving and cutting the proper amount at the proper time.

Example . . . In another instance, a 5,000-ft. 1¼-in. line was used to drill three complete wells to a depth of around 13,000 ft. and drilled a good share of a fourth well before being retired. Total service for the line exceeded 70,000 ton-miles.

This is over 14 ton-miles per foot or over two and two-thirds times as much service per foot as would have been obtained with lines of average length used without a well-planned program. In addition, two drilling-line changes which would have been necessary with the average lines and methods were completely eliminated, thus preventing the loss of several hours of drilling-rig time which would have been required to change drilling lines.

An engineered moving and cutting program has an increasingly fertile field for making large dollar savings in drilling-line costs as the depth of the well and the length of the line increases. Therefore, the longest length of line which can be economically handled should be used.

Reference

2. A.P.I. Recommended Practice on Application, Care and Use of Wire Rope for Oil-Field Service, A.P.I., RP 9B, Section V.

Comments on

Increase Drilling-Line Service by Proper Moving and Cutting

by A. S. Hayes, Jr.*

THERE are three procedures for buying casing lines. First, only enough line to reeve the system of a particular rig is purchased. Dependent upon drilling conditions, this line will either wear out in the "critical wear zone" or "fatigue out" over the dead-line sheave. When it is forced into retirement, at least 80 per cent will be suitable for continued service. This is obvious, undesirable waste!

Second purchase custom entails buying a longer line than is necessary to rig up and move it through the system by visual inspection. But, as Mr. Kemple pointed out (see Parts 1 and 2), the critical wear zone of most casing lines occurs six to eight hundred feet from the drum end. Therefore, when broken or severely peened wires are detected in this zone, it is too late to move the line methodically through the system. Several hundred feet has to be chopped off to assure safety, and the theoretical economy of buying longer lines is dissipated.

Third purchase practice is to buy a line at least twice the length needed to reeve the system and to engineer it carefully throughout its service. This means moving and cutting the line according to experience work - capacity rates. The result should be even wear for every foot of line that travels through the critical wear zone.

Assuming this last procedure is the only economic way, let us examine the components of an engineered moving and cutting program. An operator should know the weights, dimensions, and limitations of his drilling rig and equipment. If certain low-cost items affecting the service of a wire line are faulty or obsolete, they can be replaced at great saving. Wire lines, being an expendable commodity, continue to cost money endlessly if abused.

Add More "Reserve Line"

A casing line should be purchased so that "reserve line" equals the "working line." "In any moving and cutting program, the initial amount of reserve line is the payoff!" This summary statement is illustrated below.

Example . . . If 2,000 ft. of 1⅛-in. was bought to reeve a 1,500-ft. system, there would be 500 ft. of reserve line. As Kemple pointed out, 9,000 ton-miles would be reasonable service for such a line.

But . . . If 3,000 ft. were bought, 1500 ft. of reserve line could produce 27,000 ton-miles. So, for one and one-half times the length or initial cost, three times the ton-mile service is attained. In dollars and cents, the reduction in wire line cost would be 50 per cent.

(Continued on page 84)

*Los Angeles district office, Jones & Laughlin Steel Corp. Presented as A.P.I. discussion of preceding paper by J. N. Kemple.

Another Important Project

DESIGNED, ENGINEERED AND BEING CONSTRUCTED BY BORN

Tide Water Associated Oil Company selected BORN to design, engineer and construct their new 15,000 barrel per day 2-stage crude oil topping and vacuum unit. Now being constructed, this new unit will be in operation by the end of the year.

For details see the Tide Water Story in this issue.

When planning new construction or modernization of existing facilities call BORN; for there is a distinct advantage in having every detail of design, manufacture and construction under the experienced, properly qualified management of BORN.

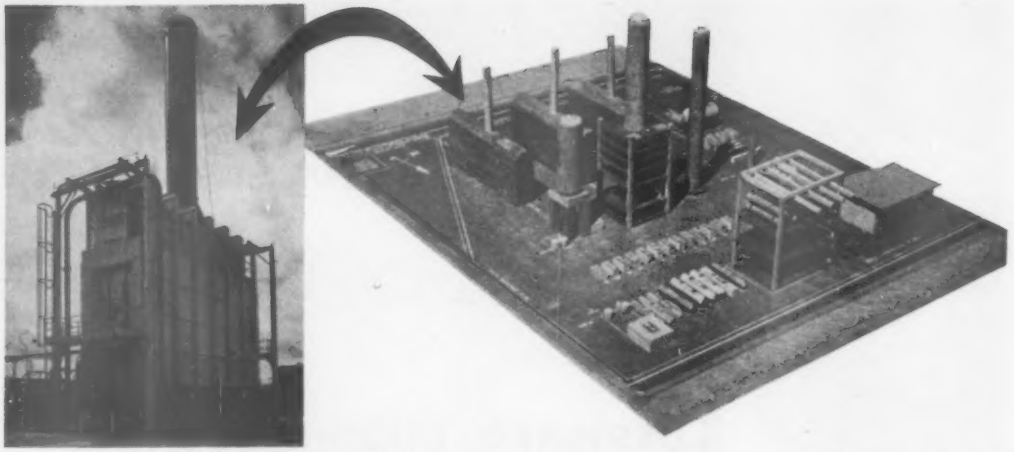
BORN Engineering Company

ENGINEERS and CONTRACTORS

TULSA, OKLAHOMA

LOS ANGELES, CALIF., SHREVEPORT, LA., NEW YORK CITY, N. Y., HOUSTON, TEXAS

Canadian Associates: BRANDON, MANITOBA, Canadian Brown Steel Tank Co., Ltd.



Scale-model layout of Tide Water's new two-stage unit, right. At left is pictured the type of heater that will be installed in the new crude-oil distillation unit. Three of these units will be required.

Tide Water's Drumright Plant Getting New Two-Stage Crude-Oil Distillation Unit

Efficient plant layout was achieved by the use of small-scale simple models

SCHEDULES on Tide Water Associated Oil Co.'s modernization program for its Drumright, Okla., refinery call for completion of the plant's second major unit by this year's end. The new installation, a 15,000-bbl. per day, two-stage crude-oil distillation unit replaces two existing units and increases, by about 3,000 bbl. daily, the refinery's current input capacity. Because of its flexibility the new crude unit will provide the Drumright refinery with a wide-range yield pattern when coordinated with the plant's first major installation, a 4,000-bbl. per day cat cracker.

With the new two-stage crude unit in operation, flow arrangement will be about the same as the current hookup at Drumright. In service it will replace a shell-still battery equipped with fractionation columns and a vacuum distillation unit. This latter unit, erected nearly 25 years ago, was originally installed to supply charge stock for a thermal cracker. Since the cat cracker has been in operation the existing vacuum distillation unit has been producing principally cat cracking feed stock.

Design of the new two-stage distillation unit incorporates provisions for processing three different types of pipeline crude oil. These are Mid-Continent, West Texas (Scurry), and West Texas (Slaughter).

Equipment layout in the new two-stage unit is focused on maintenance and operational efficiency. The general scheme incorporates centralization of related items such as pumps and exchangers. Each of these items, as a group, is so positioned that it may be serviced with minimum effort. The areas surrounding the new distillation unit are hard surfaced to accommodate mobile maintenance equipment. Passageways are provided so that trucks may be utilized to a high degree in maintenance operations.

Pumps for the new two-stage crude unit are located in an open-wall building. Exchangers, coolers, and similar type equipment are supported on a structural-steel frame. Permanent-type hoists are incorporated into this structure to facilitate tube bundle removal.

To fit the two-stage unit into available space at the desired point relative to other operations and with a maximum of free working area in and around the new unit, models of the basic equipment involved in the process were used. These scale models, prepared by Tide Water's staff, were made of wood. Unlike the usual plant mock-up, piping, stairways, and ladders were not included as a part of the basic equipment, consequently the cost of preparing the various models was practically negligible. Simplicity of the models is illustrated in the accompanying photograph.

Scale of the various models was adjusted so that the over-all plant layout could be included on a single standard-size drawing. This was accomplished by setting a scale on the available building space to fit the standard drawing sheet then making the simple models to this scale. The actual plot plan for the new unit was made by marking on drawing paper location of the different equipment items after they had been suitably positioned.

A large scale model of the entire unit is being prepared accurately in detail, by the contractor. This layout will include all principal piping, stairways, ladders, and other like items. The over-all plant model will be utilized in operator training prior and during startup of the two-stage unit.

In general, the flow scheme currently in use at Drumright is set up for vacuum column overhead to run to either thermal or catalytic cracking as de-

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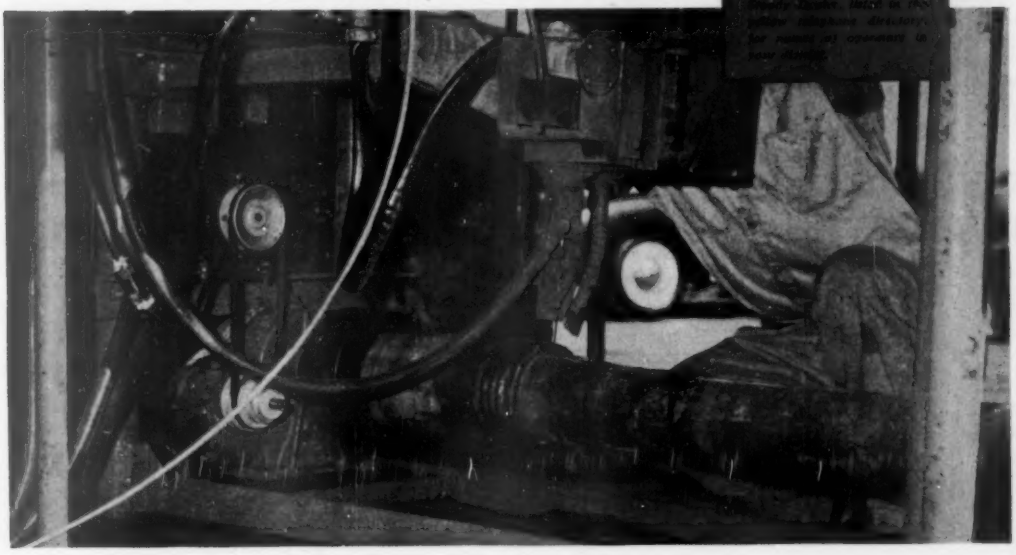


sired. Bottoms from the vacuum operation are divided between asphalt manufacture and blending stock for Nos. 5 and 6 fuel oils. Asphalt stock is not processed to finished products at Drumright, but is sold for processing by other refiners. Yields from atmospheric distillation via existing equipment are conventional, with bottoms from the operation going to feed for the vacuum unit.

The new two-stage distillation unit coordinates into the refinery's flow scheme to give the broad flexibility needed in today's refinery operations. Without respect to the specific kind or type of crude oil being processed, the over-all range of products at Drumright, in addition to various gasolines and different grades of kerosine, will include burning oils, tractor and diesel fuels, and commercial fuel oils.

Drumright refinery's setup on gasoline includes facilities for producing blending stocks. Polymer gasoline is produced with a catalytic unit which obtains its feed stock via a recently completed gas-concentration system. Before being processed in the cat polymerization plant, stock from the gas-concentration operation is Girbotol treated. In the over-all processing of cat cracker gas, commercial liquefied gas is manufactured.

The new unit's operational flexibility is due primarily to incorporation of three heaters in the layout. One of these Born Upflo units serves to preheat the incoming crude-oil charge. Another Upflo unit supplies heat for the atmospheric section of the two-stage unit. The third heater serves in operation of the vacuum section of the two-stage plant. Each of these heaters may be controlled to provide desired heat input to its respective sections of the operation as needed.

Contractor on both engineering and construction of Tide Water's new two-stage plant is the Born Engineering Co., Tulsa.

Carbide & Carbon Chemicals Co., Texas City

(Continued from page 64)

$$CH{\equiv}CH + CH_2{-}COOH$$

$$\downarrow$$

$$CH_2{=}CH{-}O{-}\overset{\overset{O}{\|}}{C}{-}CH_3$$

The monomer may then be polymerized in any of several ways to form polyvinyl acetate.

Interestingly enough, the acetic acid used to produce the vinyl acetate may also be synthesized by use of acetylene as the starting material and progressing through acetaldehyde and the anhydride to the finished product.

In this process, the initial step is the hydration of acetylene in the presence of mercuric ion and dilute sulfuric acid to the acetaldehyde.

$$HC{\equiv}CH + H_2O \xrightarrow[H_2SO_4\ (dil)]{Hg^{++}} [CH_2{=}CHOH] \longrightarrow \underset{\text{Acetaldehyde}}{CH_3CHO}$$

The acetaldehyde is then oxidized to peracetic acid, which when reacted with additional aldehyde forms acetic anhydride, which in turn forms the acid upon hydrolysis.

$$CH_3CHO + O_2 \rightarrow \underset{\text{Peracetic acid}}{CH_3\overset{\overset{O}{\|}}{C}{-}O{-}O{-}H} + CH_3CHO \rightarrow \underset{\text{Acetic acid}}{2CH_3COOH} \leftarrow H_2O + \underset{\text{Acetic anhydride}}{(CH_3CO)_2O}$$

Materials from Refineries

Carbide receives gaseous raw material from Pan American Refining Co.'s adjacent refinery and also ethylene from Gulf Oil Corp.'s pipe line running to Port Arthur, where a new ethylene plant is due to go on stream by the end of this summer. In addition to the use of methane from the gas in the production of acetylene and the products synthesized from acetylene, ethylene is used as the basic starting material for most of the products produced at the plant. One of the foremost is the ethylene glycol antifreeze agent which was first developed by Carbide and marketed under the name "Prestone."

Ethylene will be used to produce the polyethylene plastic resin in the new unit now under construction. Ethylene is polymerized in high-pressure autoclaves in the presence of catalyst to long-chain molecules of molecular weights ranging from 10,000-100,000. The resulting whitish, resin granules will be compounded at other plants into finished plastic products which are used for insulating and packaging applications. Estimate production rate is 50,000,000 lb. per year.

Straight-chain, saturated compounds prepared at Texas City are the ethylene amines, which have widespread industrial uses. Ethylenediamine, diethylenetriamine, triethylenetetramine, tetraethylenepentamine, and aminoethylethanolamine are used in the preparation of surface-active agents, ion exchange resins, dyestuffs, corrosion inhibitors and pharmaceuticals.

A large production of ethyl alcohol is realized by the hydrolysis of ethylene in the ethanol facilities at Texas City, and ethylene oxide is also produced by the oxidation of the ethylene gas.

Products produced at Carbide's Texas City plant include:

Acetic acid, acetic anhydride, acetone, acetylene.

Butyl acetate, butyl alcohol.

Diethylene glycol.

Ethyl acetate, ethyl alcohol, ethyl ether, ethylene amines, ethyl dichloride, ethylene glycol, ethylene oxide.

Isopropyl acetate, isopropyl alcohol.

Methyl alcohol, methyl isobutyl ketone.

Trichlorethane, triethylene glycol.

Vinyl plastic materials, "Vinylite" resins including vinyl chloride and vinylidene.

History . . . Carbide & Carbon Corp. is a division of Union Carbide & Carbon Corp. The Texas City plant of the organization first went on stream in May 1941 with the production of ethylene. During the following month, only finished products made and shipped were alcohol and acetone. However, before the end of the year other units were placed on stream and extensions were made to the acid plant and oxide-glycol units. Completion also neared on the acetaldehyde and anhydride units, and by the time the war started in late 1941, the plant was also producing butadiene.

Other Units

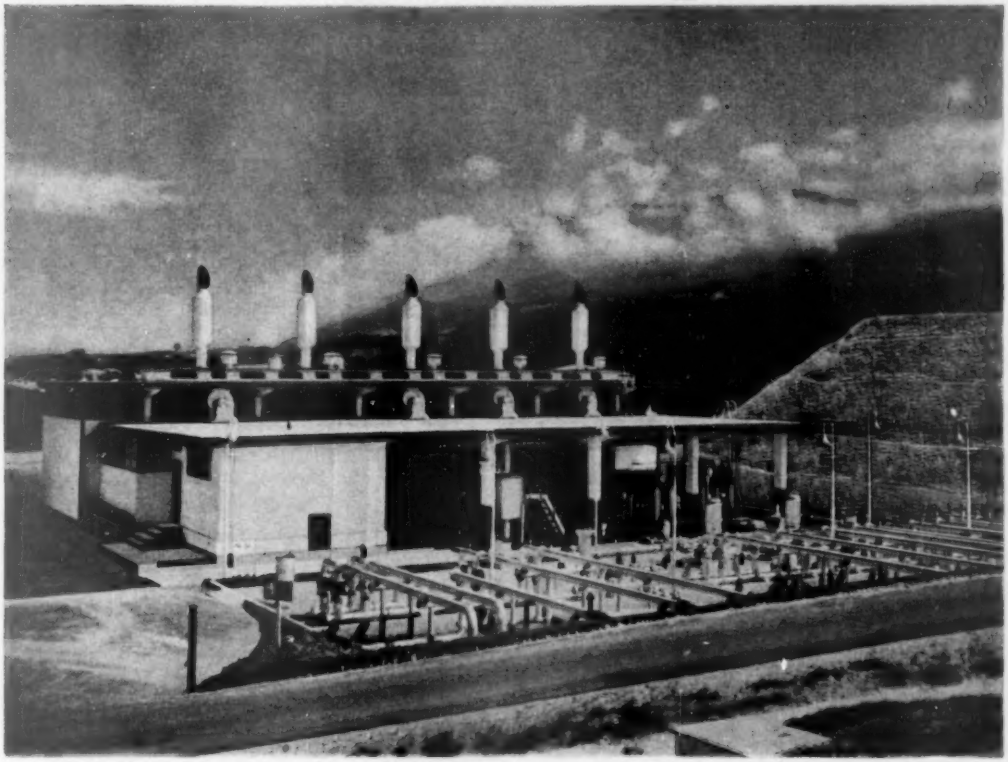
Following the war a new crotonaldehyde-butanol unit was added and expansions were made to acetaldehyde unit, gas units and oxide-glycol units. In 1947 four oxide-glycol units and an ethyleneamines unit were added. By the following year most of the construction had been completed on ethylene dichloride unit, the vinyl chloride unit, and major extensions to acid plant and ethanol unit.

Plant superintendent from the beginning of the Texas City works has been H. M. Ross. Assistant superintendents are F. H. Belden, Dr. C. M. Blair, E. J. Fox, G. L. Pitzer. Maintenance superintendent is R. F. Bobbitt, plant engineer is P. A. Smith, and supervisor of utilities is G. M. Gill.

NEXT WEEK'S Petrochem Report, third in a continuing series in the Journal, will be devoted to the Houston plant of Phillips Chemical Co.

RIGHT: *Macco pipeline maintenance man replaces a faulty gas meter in suburban Los Angeles.*

BELOW: *Macco Panpacific, Inc. built pumping station at Catia de la Mar, Venezuela, the oceanside terminal of the famed "Steep-Inch" pipeline. This pipeline, (also constructed by Macco) originates at Catia de la Mar, traverses precipitous mountain terrain from the harbor to the Nueva Caracas terminal, 3500 feet above sea level. Recently completed, the project cost approximately $6 million.*



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Demonstrate Flexible Refinery Operation

(Continued from page 56)

Material balances . . . Material balances and operating conditions for the T.C.C. section of the refinery for each of the three flow diagram cases mentioned above are shown in Table 1. The product volume and weight balances are based on the T.C.C. reactor fresh feed charge. The refinery fuel gas contains the excess butanes not needed for blending. The product gasoline was blended to 10.5-lb. R.v.p.

It should be noted that the octane numbers shown are for the total gasoline streams from the catalytic cracking sections of the plant. These gasoline streams include, in all cases, large amounts of straightrun gasoline. Thus, Case 1 includes the straightrun gasoline present in the whole crude charged to the T.C.C. tar separator as well as some thermal cracked products from the thermal unit wet gas stream. In Cases 2 and 3 all the straightrun gasoline from all the crude being processed by the refinery is included.

The average reactor temperature in Cases 2 and 3 were considerably higher than in Case 1. Thus the octane values reported for these cases exceed that reported in Case 1.

Catalyst consumption . . . The T.C.C. catalytic cracking section operates on Socony synthetic bead catalyst. The catalyst attrition losses have been low from the initial operation of the T.C.C. unit. The average catalyst loss for the first 6 months' operations is 1.22 tons per stream day or approximately 0.4 lb. per barrel of reactor charge.

The catalyst attrition loss for the second 3 months' operations is 1.0 tons per day or 0.3 lb. per barrel of reactor charge. This normal attrition rate has maintained an equilibrium catalyst activity level of 32 which is optimum for the refinery. Additional catalyst makeup is not required to maintain a satisfactory equilibrium catalyst activity.

Increase Drilling-Line Service

(Continued from page 78)

Let us differentiate between moving and cutting. **Moving a line** merely changes its position over the dead-line sheave and allows more line to accumulate on the drum. **Cutting the line** actually travels the line through the system at the proper rate for equal distribution of wear. In this sense, mov-

ing is a function of fatigue and cutting is a function of wear.

Three Engineering Methods

A line can be moved any arbitrary length to accommodate drilling conditions in the field. But, a line must be cut at the engineered rate to assure maximum service. The first two methods of engineering a casing line will illustrate this point.

First method . . . The moving rate is a multiple of the cutting rate. As the line moves through the system toward the drum, the correct cutting rate is established by the accumulation on the drum. Whenever this accumulation is cut off, the line is moving through the system at the proper rate. This method is the easiest to enforce in the field because it is natural and automatic periodically to cut back the accumulation on the drum to the original amount.

Second method . . . is to move the line a very small amount—say 3 to 5 ft.—just enough to change the fatigue point over the dead-line sheave. Less line accumulates on the drum and consequently less abuse is inflicted upon the critical wear zone. This method can be successful only if the field men realize that drum accumulation is irrelevant and that the proper cutting rate must be maintained. However, if this procedure is conscientiously followed, the decrease in line wear on the drum should effect a decrease in the cutting rate and an increase in the life of the line.

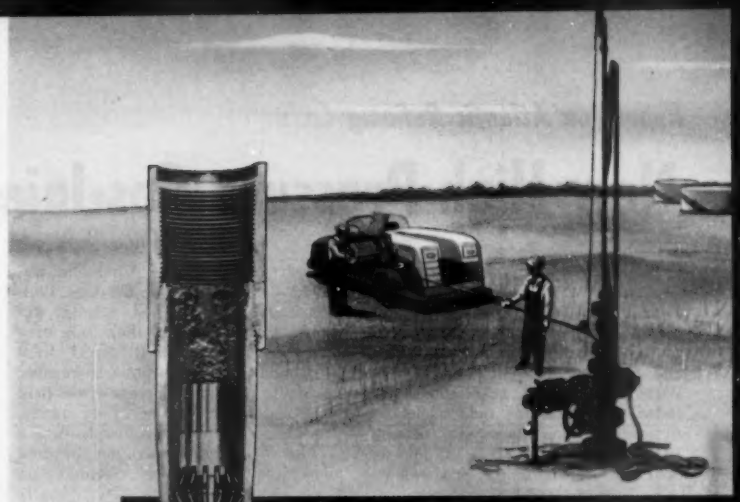
Third method . . . of engineering a casing line is to provide field men the charts or tables for obtaining ton-mile service. In this case, ton-miles are tabulated after each round trip. Then, when the total reaches the predetermined cutting frequency, the predetermined length cut is made. Any length moves can be made in this system too, as long as the cutting rate is maintained. This is the most precise method of all but it is also the most difficult to enforce in the field.

In closing, it is pointed out that selection of the most workable plan should be determined with the limitations of the field crew in mind. Any moving and cutting program will require training. No system of engineering the service of a casing line will be better than the personnel employed to carry it out.

BOOK

REFERENCE REPORT ON CERTAIN OIL AND GAS FIELDS OF NORTH LOUISIANA. Vol. 3. Reprinted by the Shreveport Geological Society, Shreveport, La. $3.25.

The society reports that it has this report available, and that it also has available a limited number of Volume 1 of the report available at $3 per copy.



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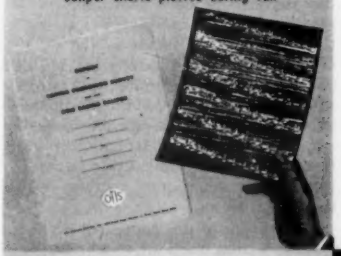
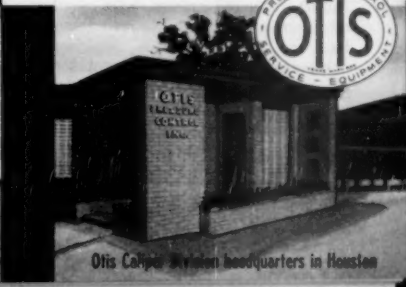
Otis reports include photostats of actual Caliper charts plotted during run



Calipering pumping wells for rod wear



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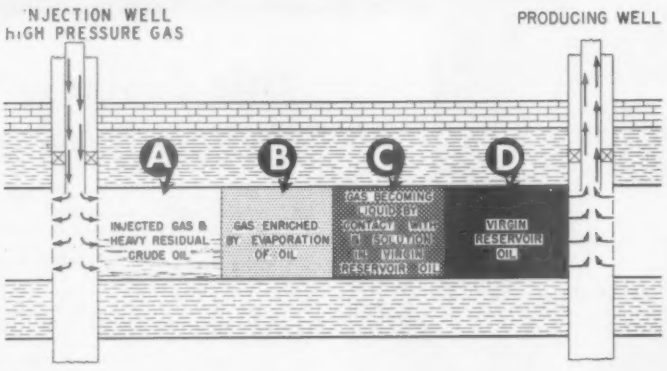
Report on Atlantic Refining Co.'s

New High-Pressure Gas-Injection Method

SHORTLY after discovery of the Block 31 Devonian Reservoir it was evident that some form of pressure maintenance should be considered, because of the expected drive mechanism and relatively low well productivity. With this objective, negotiations were started to unitize the field while confirming reservoir data were accumulated. On January 1, 1948, approximately 2 years after the first well was drilled, four operators, Champlin Refining Co., Continental Oil Co., Phillips Petroleum Co., and Atlantic Refining Co., combined their operating interests to form the Block 31 Joint Operations. This was possible because the entire producing acreage of the field is owned by the same royalty owner, the University of Texas Lands.

The original joint operation consisted of 4,160 acres developed essentially on a 160-acre pattern with 26 Devonian wells of which 11 were dually completed with the Ellenburger. Atlantic, as operator of the unit, proceeded with the design and installation of compressor facilities, gathering lines, and injection system which would utilize all gas produced from the Devonian and Ellenburger formations in the field.

In January 1950 the first addition of 1,120 acres was made to the original



Here's how it works . . .

The schematic drawing of the reservoir between a producing well and an injection well is divided into four segments.

The segment *"D"* on the right contains the virgin reservoir oil moving into the producing well.

On the left the reservoir contains a dry gas moving out from the injection well and a heavy residual oil.

In the center are the two interrelated segments in which the high-pressure gas process occurs, as follows:

• The segment "C" immediately behind the virgin reservoir oil contains a transition zone in which an enriched gas grades into a liquid. Gas, before entering this zone, has become enriched through contact with residual oil in passage through the reservoir and has by virtue of this enrichment achieved a high degree of solubility in the virgin oil. This source of enriched gas contacting virgin reservoir oil creates a bank of swollen liquid which is light in gravity and approaches the viscosity of the virgin reservoir oil.

• The segment "B" of the reservoir is where the oncoming gas is enriched by evaporation of residual oil. As the swollen liquid bank of the transition zone displaces the virgin oil ahead, the residual product remaining is a swollen oil characterized by a high formation volume factor in the range of 3 to 5 reservoir barrels per stock-tank barrel. As oncoming gas moves across this swollen product, evaporation of the lighter hydrocarbons occurs, enriching the gas. This enriched gas then repeats the same cycle of contacting and going into solution with the virgin oil.

• Net result of this continued cycling process is that back of this transition and enriching region is a zone "A" containing only dry oncoming gas and a heavy residual product (estimated at 15° A.P.I. gravity in the Block 31 reservoir).

Thus the increased recovery by high-pressure gas injection is gained principally by (1) improved displacement efficiency resulting from decreased viscosity differentials between displacing and displaced fluids and (2) evaporation and solution effects which reduce the final residual oil saturations in the reservoir.

Laboratory experimentation . . . The Block 31 Devonian crude oil and reservoir were studied for application of this high-pressure gas process and found favorable.

Laboratory evaluation was performed using a 25-ft., high-pressure vessel, packed with unconsolidated sand, to simulate the flowing and displacement process that occurs in the reservoir. Devonian crude, at the reservoir saturation pressure of 2,760 psi., was pumped through the sand column. Lean tail gas was then pumped into the column, displacing the oil at a pressure of 3,500 psi. The fluid withdrawals from the column were measured, sampled and analyzed.

Recoveries . . . The results of several runs as described, indicate that approximately 76 per cent of the charged oil can be recovered by the high-pressure gas process. Obviously, the relative permeability characteristics of this test column are different from those found in Block 31 Devonian rock. A correction factor was applied, taking this into consideration, so that the result estimated in Block 31 is 69 per cent rather than the 76 per cent measured.

*Laboratory work by Atlantic Refining Co. concerning this subject has already been published as "Preliminary Report on Oil Recovery by High-Pressure Gas Insertion," by L. P. Wharton and W. L. Kieschnick, Jr., The Oil and Gas Journal, April 6, 1950, p. 78 et sec. (Mid-Continent District A.P.I. paper, Oklahoma City.

. . . as applied to Block 31 Devonian Reservoir Crane County, Texas

by B. L. Griffith* and V. M. Hollrah*

joint operations and a second addition of 960 acres and full unitization of the field is being negotiated at present.

Block 31 Devonian field now covers an area of some 6,000-7,000 productive acres and is essentially developed with the present 68 completed wells. There are two developed 160-acre tracts in the field outside the unit area which are not participating in the pressure-maintenance program.

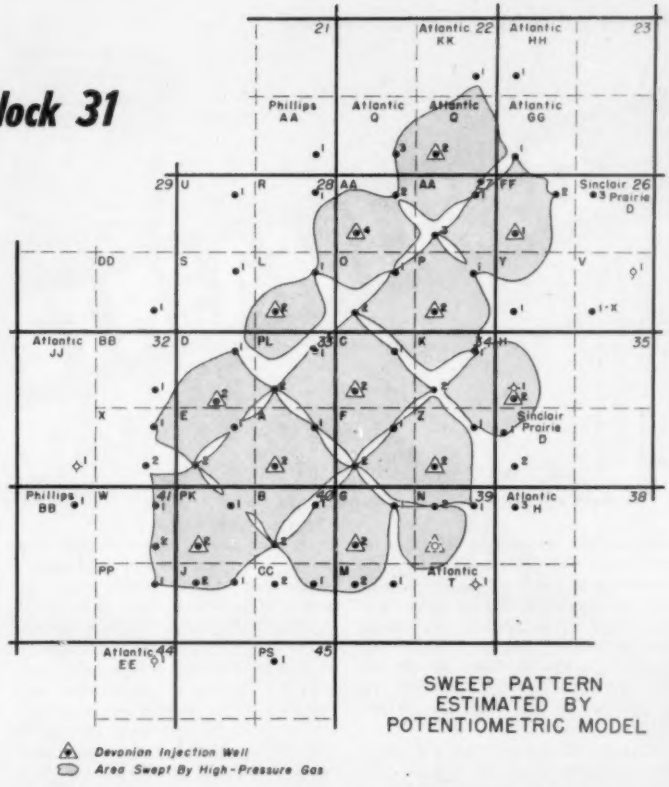
Reservoir Rock and Fluid Characteristics

The Devonian formation in this field is encountered on the crest of an anticlinal structure at a depth of 7,900 ft. and has a gross thickness of 1,000 ft. The main oil-producing section is in the interval from 450-800 ft. below top of the Devonian. This 350-ft. interval contains some 85 per cent of the oil in place and is the only portion of the reservoir which is considered for gas injection at present. Up to 185 ft. of this section is net pay in some of the higher structural wells.

Porosity . . . The reservoir rock appears to be a limy and dolomitic sand with intergranular porosity ranging up to 28 per cent, and averaging 15 per cent over the net pay section. Some small fractures were noted in cores but these are not believed important and may have occurred during or after coring.

From the three cores taken in the Devonian pay section, it was possible to obtain a good correlation with electric and radioactivity logs with which the entire reservoir could be analyzed. An accompanying chart shows a typical log of the Devonian with corresponding porosity from core analysis through the main pay section.

*Atlantic Refining Co., research and development department, crude-oil production division, Dallas. Paper presented at fourth oil-recovery conference, Texas Petroleum Research Committee, Austin.



Permeability . . . Although the porosity averages 15 per cent through the pay section, the permeabilities are extremely low. Effective permeability calculated from reservoir pressure build up analyses range from 0.1 to 3 md. with an average of 1 md. Air permeabilities from core analyses are somewhat higher with a weighted average of 2.7 md.

Water . . . An average interstitial water of 37 per cent was determined for the reservoir by subjecting plugs to high-speed centrifuging and correlating the results with permeability and capillary pressure curves. There has been no evidence of any gas cap in the formation.

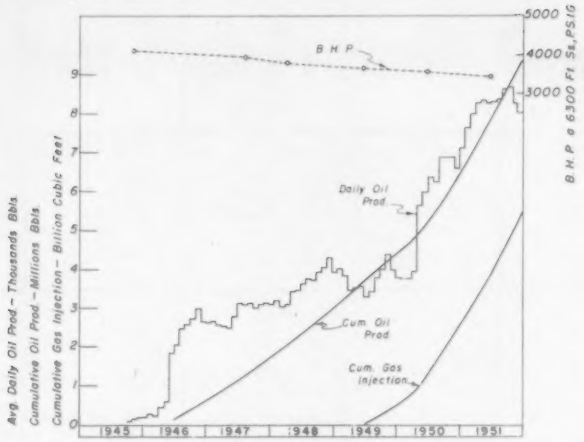
Gas . . . Analysis of the crude shows the oil to have 1,212 cu. ft. of gas per barrel in solution at saturation pressure of 2,764 lb. Gravity is 46° A.P.I. and viscosity at saturation pressure is 0.3 cp. It should be noted that the saturation pressure is almost 1,400 lb. below the initial reservoir pressure.

Past Reservoir Performance

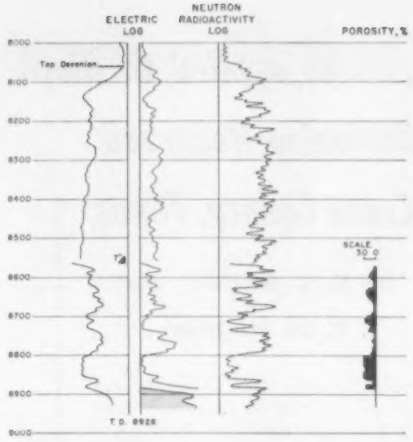
During the 3½ years prior to starting gas injection, 3,700,000 bbl. of oil was produced with a decline in reservoir pressure from an initial of 4,145 to 3,650 psi. (see figure). The determination of actual reservoir pressure was complicated by the low permeability and slow pressure buildup. Extensive pressure surveys were taken annually and a method was developed for calculating final reservoir pressure from buildup curves. This method, developed by Miller, Dyes, and Hutchins, based largely on data from this field, was published in A.I.M.E. Transactions, April 1950. The accuracy of the calculated final pressures was confirmed to some degree when pressures taken on completion of infill wells checked closely the calculated pressures for that portion of the field. It also indicated that the initial development on a 160-acre well pattern was draining the reservoir even with the low permeabilities.

Gas injection was begun in June 1949 in the Joint Operation C-2 well located near the center of the field. This well, which had been completed several months earlier, had been used as a producing well until injection started. Productivity and buildup data accumulated during this period were used in predicting injectivity of later wells converted to injection. With the well-head injection pressure of 4,100 psi., 3½

Atlantic's new gus injection method . . .



PAST PERFORMANCE, Block 31 field, Crane County, Texas



. . . and typical log of the Devonian reservoir, Block 31.

million cubic feet of gas was injected daily. This well has been on injection almost continuously to the present time with no appreciable change noted in its injectivity. In November 1949 injection was started on the P-2 well two locations to the northwest of the initial injection well. The injectivity and perfomance of this well were similar to the C-2 well.

Bottom-hole-pressure tests were taken at a depth of 8,800 ft., opposite the formation face, on these two wells while gas injection was taking place at a well-head pressure of 4,100 psi. The flowing injection pressure recorded at the bottom of the hole for 14 hours was approximately 5,130 psi. After the wells were shut in the pressure dropped almost immediately to 4,900 psi. and at the end of 28 hours the pressure was 4,750 psi. and declining at only 3 psi. per hour. At the time these tests were taken, the average reservoir pressure was approximately 3,600 psi. This indicates that the injection-gas zone is at a considerably higher pressure than the reservoir's average, and substantiates calculations.

Two wells were put on injection during 1951 and one well in April 1952, to meet increasing injection requirements and to permit a more dispersed pattern of injection throughout the reservoir. An accompanying map of the field shows wells currently on injection as well as the proposed unit outline and well completions.

From June 1949 to July 1951, 4,100,000 bbl. of oil was produced with a drop in reservoir pressure from 3,650 to 3,450 psi. During the same period a total of 3,797,334 M.c.f. of gas was injected into the reservoir having an equivalent volume under reservoir conditions of 2,548,000 bbl. Although it is too early to state conclusively, it appears that a limited water influx is occurring in the reservoir which amounts to an estimated 3,000 bbl. per day.

To date there has been no indication that the Devonian reservoir has been affected by the injected gas other than the retarded pressure drop. During the June 1951 pressure survey, producing wells offsetting the injection wells showed generally a smaller decline in pressure relative to other producing wells in the field. In one instance the pressure actually had increased slightly over the previous survey. No increasing ratios or other signs of gas breakthrough have occurred after nearly 3 years of injection, but this is significant only to the extent of eliminating the possibility of channeling through the fracture system as calculations show that injection should be continued for several more years before breakthrough occurs.

During March 1952, the daily production from the reservoir was 8,370 bbl. of oil, 36 bbl. of water, and an average of 10,380 M.c.f. of gas. This amounts to a reservoir voidage of 14,100 bbl. per day as compared to an average of 8,733 M.c.f. (reservoir equivalent 5,860 bbl.) per day of gas injected.

Euipment for Pressure Maintenance

Original plan for pressure maintenance was to inject all gas produced from the Devonian and Ellenburger formations into a portion of the Devonian reservoir with the objective of increasing the ultimate oil recovery and maintaining the productivity of producing wells.

A sufficient number of injection wells were to be utilized on the crest of the structure to handle the volume of gas available and the compressor plant was based on expected capacity requirements some 2 years in the future considering probable continued development. Additions to these facilities were to be made as required.

Compressors . . . Initially three 800-hp. compressors were installed. Two of these were designed with intake pressure of 7 psi. and the third with 120 psi. The combined discharge capacity of the three compressors was approximately 7 million cubic feet per day at 4,100 psi.

Increasing field-gas production necessitated additional compressor capacity and in May 1951 a fourth compreessor, 880 hp., was added which increased the delivery capacity to 9 million cubic feet per day at 4,100 psi. The intake pressure on this fourth compressor is also 7 psi.

Incidental to compression and cooling of the gas, approximately 16,000 gal. per day of liquid products are recovered and stabilized. All of the gas produced in the field by the joint operators is processed through the plant. A portion of the gas is sweetened and used for plant and lease operations.

Gathering . . . Two gathering systems were installed in the field. The first, or high-pressure system, is connected to the separators of wells capable of flowing against a 125-psi. separator pressure; the other, or low-pressure, system takes the remainder of the gas in the field from wells unable to produce against the higher pressure. The systems were of sufficient capacity to

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take care of any anticipated future needs.

Input wells . . . The first two wells put on injection were initially completed in anticipation of using them as injection wells. Casing was set to total depth and all of the main producing section in which gas was to be injected was perforated. Gas was injected through 2½-in. N-80 tubing using a packer to load the annulus with oil and keep the pressure off the casing. Considerable difficulty was experienced with leaks occurring generally at the collars which allowed the casing annulus to pressure up. In order to overcome this difficulty, N-80 tubing with Hydril joints was run in later injection wells, and the casing was loaded with salt water base mud to reduce the differential pressures across the tubing. The well-head equipment consists of a scrubber, recording orifice meter, and a 10,000-psi. test christmas tree.

Duals . . . In the higher structural portion of the field nearly all wells were dually completed. In these dual completions the Devonian formation is producing at a depth of 8,500-9,000 ft. through the casing and the Ellenburger is producing below 10,250 ft. through the tubing.

The third well put on injection, the A-2 well, was such a dually completed well. An attempt was made to inject gas through the tubing using two packers and a crossover arrangement so the Ellenburger could be produced through the annulus. This was unsuccessful because of mechanical difficulties so the Ellenburger formation was temporarily plugged off and the allowable transferred to other Ellenburger wells in the field. When steel supplies permit, the plug will be drilled and a liner of 5½-in. Hydril jointed heavy casing will be set in the well. This will permit gas to be injected into the casing annulus and Ellenburger production to be resumed through the tubing in much the same manner as present dually completed wells are being produced.

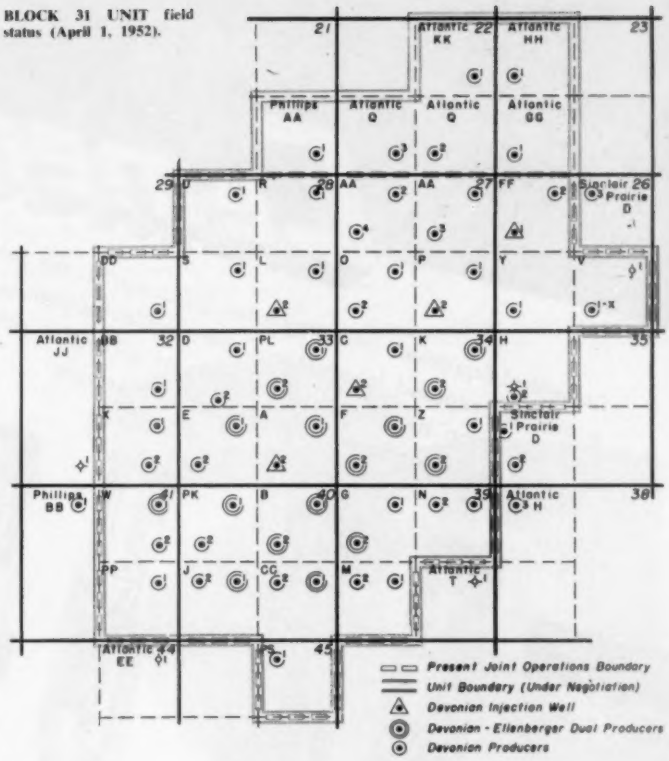
Conversions . . . In converting Devonian producing wells to injection the procedure followed is to perforate or open the entire main pay section for injection. On flank wells this may involve deepening and injecting below the water-oil contact so that the upstructure oil in the zone can be swept. The permanent type packer is run on 2½-in. tubing with Hydril joints and annulus loaded with mud.

Full Pressure Maintenance at 3,500 Psi.

Decision was reached in February 1951 to enlarge the scope of the Devonian gas injection project from partial pressure maintenance to a full pressure-maintenance program at 3,500 lb. By this change in operation it is anticipated that the ultimate recovery will be increased by 40 per cent over the present partial maintenance program, or almost 70 per cent over primary operations. Before undertaking full pressure maintenance operations five major items must be accomplished, as follows:

1. Securing an adequate source of outside gas.
2. Unitization of the field in place of the existing joint operation.
3. Addition to the compressor plant.
4. Obtainment of special field rules to allow efficient field operation.
5. Modification and enlargement of the gas injection system from two injection wells to thirteen.

At the present time it appears that the start of full pressure-maintenance will be delayed 2 to 4 months beyond the projected date of July 1, 1952, principally because of the unavailability of certain kinds of pipe and equipment. Negotiations are proceeding satisfactorily on the first two of these items and it appears that the facilities for supplying outside gas will be completed as scheduled. Unitization is virtually completed pending final approval by the board for leasing of University Lands, the General Land Office, and a hearing before the Railroad Commission. The single royalty owner in the field has greatly simplified the problems in connection with the formation of the unit.



BLOCK 31 UNIT field status (April 1, 1952).

More compressors . . . Five additional 880-hp. compressors are now being installed. These, together with the existing plant, make a total of nine compressors with 7,680 hp. The capacity of this enlarged plant will be in excess of 30 million cubic feet of gas per day at a delivery pressure of 4,100 psi. Approximately 45 per cent of this amount will be makeup gas purchased outside the field at 500-800 lb. pressure.

MER's . . . On August 1951 a hearing was held before the Railroad Commission of Texas at which time application was made for (1) permission to undertake full pressure-maintenance operations in the Devonian reservoir, (2) determination of a field MER under full pressure-maintenance operations, and (3) to exempt the field from shutdown days, such MER and exemption

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CEMENTROL SHOE

Provides an annular packoff and an internal bridge that prevent downward passage of slurry and subsequent contamination of exposed formation below casing seat.

Cementrol Shoe Running-in Position

Cementrol Shoe in Pack-Off Position

CEMENTROL COLLAR

Operates just as Cementrol Shoe to direct slurry upwardly above perforated liners, formation crevices or other zones of lost circulation located at any point above casing seat.

Cementrol Collar Running-in Position

Cementrol Collar in Pack-Off Position

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Flapper-type Collar Pumping Through

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to be effective when the high-pressure gas-injection system is in operation.

In regard to the MER, it was recognized that the complete program might not be put into operation at one time because of material shortages and the table shown below was adopted by the commission as a basis for determining the field oil allowable. In this table, volumes shown in the "Gas Injection M.c.f." column were calculated as those necessary to replace reservoir voidage at 3,500 psi. at corresponding rates of production shown in the "MER, Barrels Per Day" column:

Gas Injection M.c.f.	MER, Barrels Per Day
28,200	13,500
26,000	12,300
24,000	11,500
22,000	10,700
20,000	9,900
18,000	9,100
16,000	8,300

It was necessary to obtain exemption from shutdown days because of the complexity of the practical operation of such an interrelated injection and production system. To obtain maximum areal sweep efficiency it will be necessary to balance the rate of injection between the various injection wells and at the same time control the rate of oil withdrawal from producing wells. This situation is further complicated by the variations of the purchased gas supply. During periods in the winter, little or no gas may be available and this shortage must be made up during the summer months.

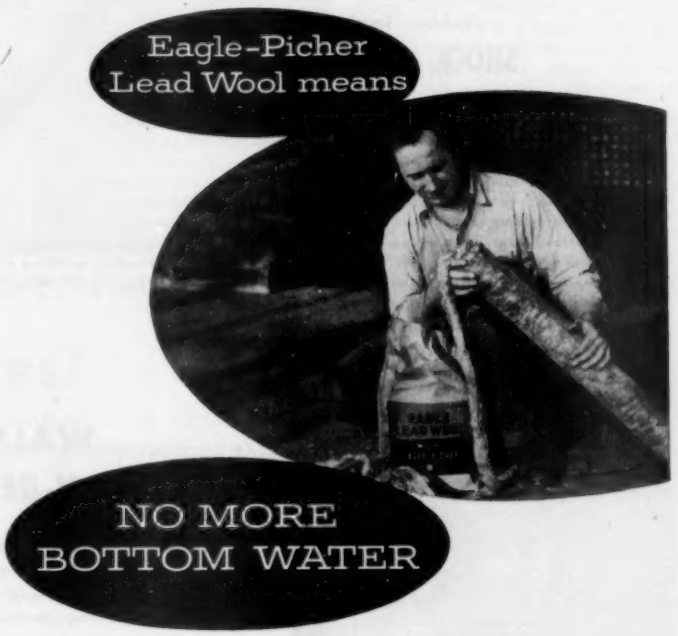
Input-well location . . . The initial plan for pressure maintenance in the Devonian reservoir was to inject all the produced gas from the field into two or more wells along the crest of the structure. As plans were formulated for full pressure maintenance, it was determined that because of low permeabilities in the reservoir, pressures could not be maintained on the flanks by any type of line injection along the crest. Maintenance of a 3,500 psi. pressure at the oil-gas interface is essential to the successful operation of the high-pressure-gas process.

The 13-input-well system approximates a nine-spot pattern and is considered the optimum among the many combinations of injection and producing wells studied. In addition to permitting a good areal sweep, the pattern will maintain both a satisfactorily high pressure throughout the reservoir and a substantial rate of recovery with the drilling of a minimum number of additional wells. Expansion to this system is presently taking place as the necessary pipe and other materials are delivered. Five of the needed wells are on injection at this time, and it is estimated that 12 of the 13 wells will be on injection by the fourth quarter of this year. One of the wells is yet to be drilled.

The areal sweep for the 13-input-well system has been indicated by the potentiometric model patterns (see map). From this pattern the sweep efficiency has been estimated at 77 per cent. Additional potentiometric model studies are being made to determine improvements in the sweep efficiency by shifting of rates and possible addition of new wells.

A factor of 80 per cent was applied to recovery calculations to represent bypassing of oil due to permeability differences in the formation.

Using the 69 per cent recovery factor determined by laboratory work with Block 31 Devonian crude and applying the above sweep and channel factors, the in-place oil recovery has been calculated as 42 per cent. It is believed that this recovery is greater than could be realized with any other known type of drive mechanism in this reservoir.



Keep bottom water out of your wells—and prevent costly shutdowns—by tamping Eagle-Picher Lead Wool in the hole. A watertight plug that seals every crack and crevice is made by this finely stranded, flexible metallic wool. Shipped in convenient 50-lb. sacks . . . easy to spot in special cartridge-shaped Eagle-Picher Wire Containers sized to fit all casings. Order through your jobber.

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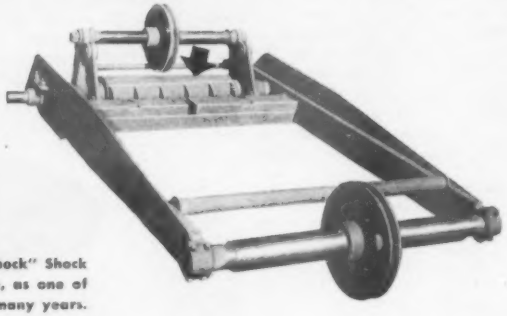
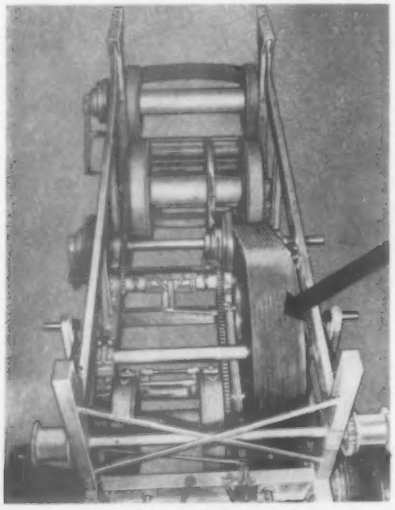
Keys to the Smoothest, Quietest Spudding Action in the Field

WALKER-NEER'S
Exclusive
"TOR-SHOCK"
(Rubber Torsion)
SHOCK ABSORBER



Cable tool men acclaim Walker-Neer's exclusive "Tor-Shock" Shock Absorber, which employs the principle of rubber torsion, as one of the most important improvements in spudder design in many years. Built into the spudding beams, the "Tor-Shock" provides a "bottomless cushion" to every stroke of the tools, providing by far the smoothest drilling motion ever known, and thus relieving stress and strain throughout the machine while giving the tools extra snap, for a faster, more efficient spudding action. Note also, in the picture at right, travelling spudding sheave and heel sheave which assure free spooling, another leading feature of Walker-Neer Spudders.



WALKER-NEER'S
V-BELT DRIVE

Walker-Neer's V-belt drive from engine to clutch shaft serves the 3-fold purpose of preventing slippage, increasing power and efficiency under adverse conditions, and reducing noise and shock. This outstanding feature coupled with the "Tor-Shock" Shock Absorber are your keys to the smoothest, quietest spudding action in the field.

To these features, add Walker-Neer's pioneering achievements in high-speed design, free spooling, rugged construction, elimination of lubrication problems, safety, and a more efficient control system, and you readily see why the industry looks to WALKER-NEER for LEADERSHIP in spudder manufacture!

ROLLING ON THE PAINT are George Stefanik, left, and John Regan, first-class painters at Esso Standard Oil Co.'s Bayway refinery at Linden, N. J. The roller method saves money and time, eliminates mess.

Painting Fences?

You'll be interested in this method which makes the job of your paint crew easier and greatly reduces expenses

ASK any refinery or gasoline-plant foreman what he thinks about painting fences, and you'll get a reply which in all probability won't be music to your ears.

This is due to several factors, among which are:

1. Painting chain-link-type fencing with brushes is a messy job, since the brush usually "snaps," splattering paint all over the crew and surrounding area.

2. If the spray-gun method is used an extra workman has to be around to erect and move cardboard or wooden screens to keep the wind from blowing the paint on parked automobiles, shrubbery, houses, etc.

3. The costs are high for either method, running about $2,700 per mile for the brush method, to $2,244 per mile for the spray-gun method.

New way . . . However, thanks to Edward A. McGann, assistant general foreman of the carpenter and painting department at Esso Standard Oil Co.'s Bayway Refinery, Linden, N. J., a much easier, cleaner, and less expensive way to paint fencing of this type has been perfected.

McGann decided to put his crews to work using the roller method of applying paint. This involves use of a roller covered with a demountable cylinder of lamb's wool, and fitted with a handle. The roller is dipped into the paint, which is literally "rolled" on the fence and barbed wire, a man working on each side of the fence.

McGann assigned John Regan and George Stefanik, first-class painters, to experiment with the method. The only change was that an 18-in. handle was replaced by a 6-ft. handle, which eliminated fatigue of reaching and bending.

Quicker, too . . . The experiment showed that the two men, painting both sides of the fence, increased coverage from 350 ft. per day to 600 ft. per day.

The company has figured that a given area can be covered with 10 gal. of paint that formerly required 40 to 45 gal. A lamb's wool refill for the roller costs $1.65 compared to about $12 for a 4-in. bristle brush.

The roller method costs $1,151 per mile, or about half the cost of the cheaper of the previous two methods used.

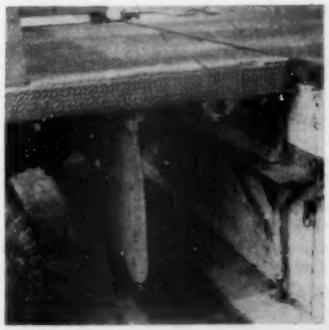
Figures reduced to cost per linear foot afford a clearer comparative picture: Brush method, $0.518; spray-gun method, $0.425; and the roller method, $0.218.

Easy Loading

Leveling support for dock makes loading efficient

LOADING a truck from a dock or removing materials with a fork lift frequently creates a problem because of uneven surfaces or a difference in height between the truck bed and the dock floor.

This has been solved by Union Oil Co. at its Oleum, Calif., refinery. The company constructed a combination bumper and truck-bed support which maintains the height of the truck bed in relation to the dock when using a



COMBINATION bumper and truck-bed support to hold truck level and in exact position while fork lift is used to load or unload.

TRUCK IN POSITION on combination bumper and bed support. Surfaces of truck bed and loading dock are level.

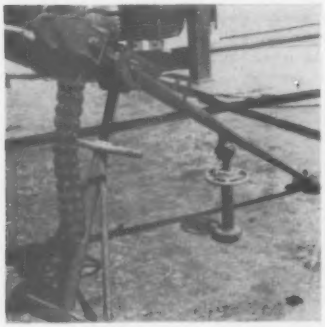
Easy loading, continued . . . fork lift handling ton-loads of paraffin on pallets for shipping.

The truck support is made from a heavy piece of angle-iron placed on standards resting in prepared sockets. These are set in concrete at the lower edge of the dock. A backing plate is welded to the lower edge of the angle iron so that it fits flat against the concrete dock wall, to spread impact of the truck as it is backed against the bumper.

Trucks modified . . . Back end of flatbed trucks are modified with a plate of heavy steel wide enough to place edge of the end of the truck bed on a plane with the top surface of the dock. Bumper-supporting pedestals move freely in sockets at the lower end and hang down so that the horizontal section of the angle iron tips downward. The unit is retained in position, as it tries to fall from the side of the dock, with chains anchored to eye bolts set in concrete.

How it works . . . In operation, the bumper hangs outward from the dock as the truck is backed against the dock. As the lower edge of the modification of the truck makes contact with the bumper, the bumper itself travels backward against the face of the dock. As this occurs, it straightens from an angle position to vertical, and by so doing, brings the tail end of the truck exactly on a plane with the floor of the dock.

Chocks against the wheels of the vehicle prevent movement away from the dock. When the truck moves away, the bumper swings outward with the travel of the truck so that the load is released gradually to the normal level of the springs of the vehicle.



PIPE TONGS, mounted on casters, are easily rolled to any spot in shop.

TONGS IN PLACE on a large connection. Handle is equipped with adjustable foot.

Labor Saver

Rollers on pipe tongs save work at Union shop

MUCH of the backbreaking work of lifting backup tongs has been eliminated in the machine shop of Union Oil Co. at Oleum, Calif.

When large pipe nipples are to be screwed to such fittings as bolted flanges, machines do a large part of the work.

Large pipe machines are used which handle any size flanges used with threaded couplings.

The flange is chucked into the pipe machine so the nipple can be stabbed into the threads.

Formerly the backup tongs, designed to take pipe from 4 to 18 in., were literally manhandled into position.

Changes made . . . A machinist modified them by attaching a pair of small rollers to the handle point, attaching a pair of blocks to each side of the handle near the jaws to receive an adjustable clamp fitted to the handle with set screws and attaching to this clamp a threaded stem, similar to the rising stem of a large gate valve.

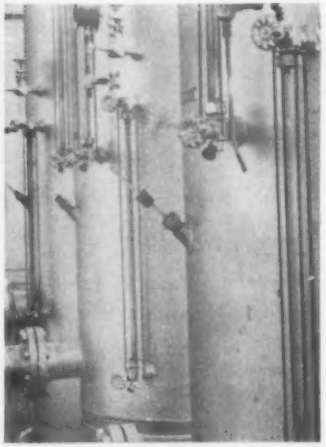
This stem slips snugly into a hollow post built into a framework supported by two small wheels. Between the hollow post and the handle of the tongs is a handwheel to provide adjustment for height of the tongs when placed on the pipe nipple to be made up into the flange in the pipe machine.

Making up the threads caused a slight bend in the handle of the pipe tongs, so an additional unit was attached. This is a clip welded to the handle drilled for a clevis pin connecting a support at this point. It also contains a threaded stem carried in a hollow post fitted with a substantial circular pad as footing when pressure is applied.

Disconnecting . . . When disconnected from the nipple, the pair of tongs can be easily wheeled anywhere in the machine shop, and as easily brought up to the machine for attaching to the pipe nipple. Adjustment for height is done with the hand wheel so the chain can be connected in the usual manner.

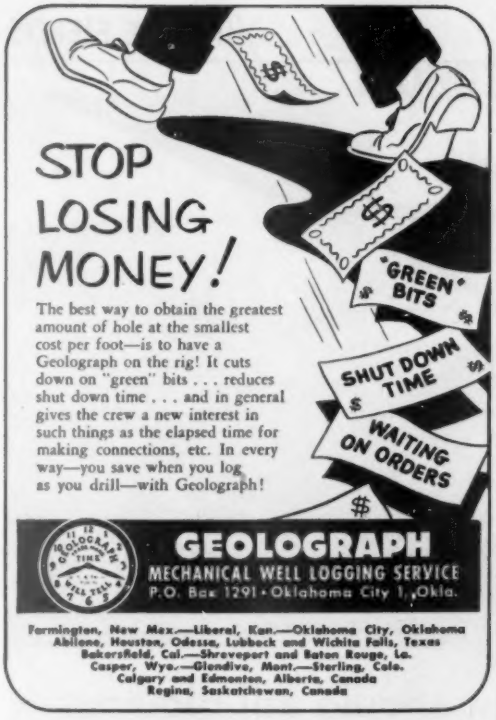
As soon as the tongs are locked for operation, the large hand wheel on the post near the head is run up on the stem so the weight of the tongs is supported by the nipple, and to provide sufficient room for the "bite" into the pipe nipple.

The handwheel on the support near the middle of the tong handle is provided with a hook to carry the hollow stem, and may be released for adjustment.



Simple, But It Works!

Corks on thermometers prevent their hitting the bottom of these vessels at Warren Petroleum Corp.'s Holiday, Tex., plant. Result: No more broken thermometers. Corks do not affect their accuracy.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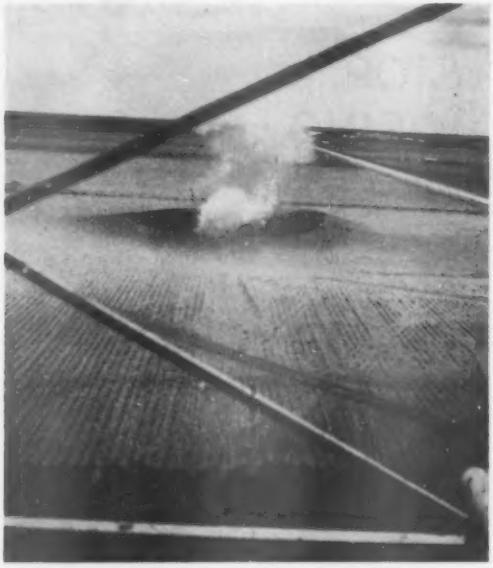


This directional well . . . should kill blowout

PROBLEM: How to put back "in harness" a wild gas-distillate well which has been blowing out of control for a month.

Solution: Drill a directional well nearby to the pay formation of the wild well, then inject water to flood off the flow.

This is the plan, at least, of Sam G. Harrison, independent operator, whose well, 1 W. E. Boehm, is blowing wild near Ganado, Tex., 80 miles southwest of Houston.

Operator expects to have the directional well completed this week, and will attempt to flood out the wild well. To achieve this, the new hole is being whipstocked to a maximum angle of 12½°. Drilling contractor on the directional hole is W. D. Appling of El Campo, Tex.

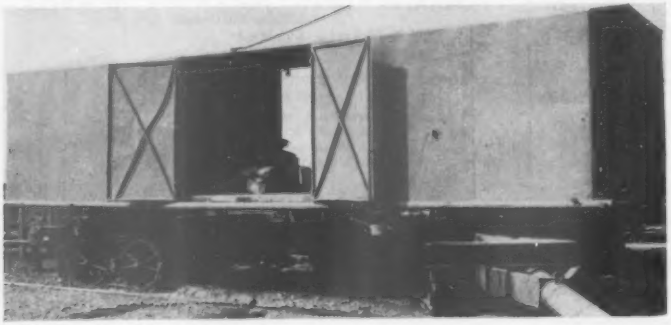
May bridge over . . . There is a possibility that the well still may bridge over and cut off its own flow of gas before the directional hole can be put to use, but it has shown no signs of diminishing its intensity of flow. *(Note arrow above).*

A crater 60 ft. deep and over 100 ft. wide has been dug by escaping gas.

Fired for safety . . . During surges of gas from the well, flames extend more than 100 ft. into the air. The gas was ignited by the operator as a precautionary measure.

The well was originally drilled as a wildcat on a location surrounded by five dry holes. The blowout occurred when operator was in process of drilling out cement after a squeeze job, in an effort to block off the gas-producing job.

The well was completed in May for 32 bbl. of oil daily, with high gas-oil ratio of 5,406-1.



Portable Mud House

Shell Oil Co. uses this portable mud house, mounted on two Athey wagons, on the Gulf Coast. The house eliminates need for emptying and reloading mud on moves. Further portability was effected by installing removable tank-type tracks on the building substructure, which allows moves with minimum of rigging down from one location to another.

Mountain-climbing pipe line being laid for keeps!

IT'S PROTECTED BY BITUMASTIC ENAMEL!

THE 26-INCH natural gas pipe line, shown here, was laid across the most mountainous part of West Virginia for the Atlantic Seaboard Corporation. Here's a sample of what the pipe liners were up against: at one point the face of Cave Mountain rose at an average rate of 45 degrees, climbing for 1,700 feet before easing off to a more gradual slope.

When pipe lines are laid under such back-breaking conditions, they *must* go down to stay . . . they *must* be fully protected against corrosion. That's why this pipe line was coated with Bitumastic® 70-B Enamel.

Bitumastic® Enamels have established remarkable records in preventing corrosion — under the most severe corrosive conditions . . . in all types of soil . . . under wide variations of temperature. Thanks to these durable enamels, many gas and oil pipe lines, laid 20 and 30 years ago, are still giving good service today.

Specify Bitumastic Enamels and make certain *your* pipe-line projects get the most effective protection against corrosion. Your Koppers representative will give you complete details and estimates.

Bitumastic Enamels soon available from Koppers new California Plant!

As soon as present construction work is completed, Koppers will be able to supply Bitumastic Enamels from a new plant at Fontana, California. The plant is being built to give you better service in the West.

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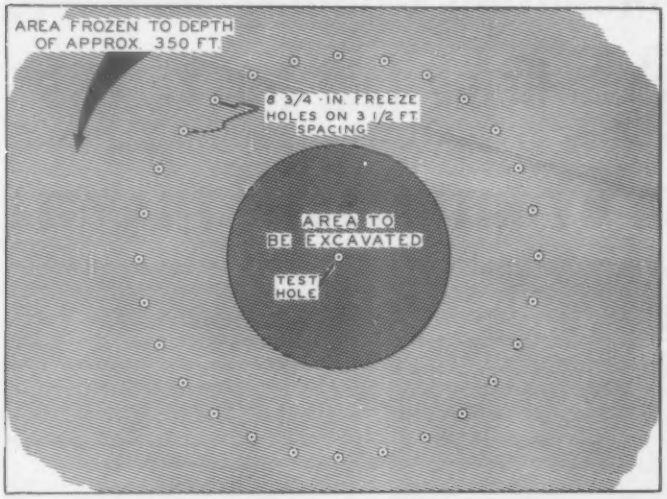


Deep "Freeze"

Drilling of "freeze holes" around area to be excavated on mining job blocks water entry so work can be completed

A NOVEL situation requiring an unusually high degree of straight-hole drilling was encountered and successfully solved near Carlsbad, N. M., when prolific water sands prevented a potash company from sinking a ventilation shaft to the desired depth of about 725 ft.

The flow of water from sands above the 350-ft. level was so great, and the sands so unstable, that two attempts by Potash Corp. of America to sink the shaft by conventional mining methods ended in failure. In one of these shafts the water flow was measured in excess of 1,000,000 gal. daily; all attempts to kill the flow by cementing were unsuccessful.

Solution . . . The solution arrived at by the contractor, Winston Brothers Co., Minneapolis, was to drill a circle of 350-ft. "freeze holes" around the area to be excavated, pump brine down the cased holes until this huge cylinder was frozen, and then sink the shaft and set a 15-ft. concrete liner through the sands while they were kept solid.

To accomplish the freezing operation in a reasonable period of time and to assure the flow of water would entirely cease, it was decided 28 wells on a 3½-ft. circumferential spacing would be required (see diagram). With wells so closely spaced, plus the necessity for keeping them from drifting into the area to be frozen, it was readily evident they would have to be drilled almost vertical. At a depth of 350 ft. a deviation of only 1° would amount to about a 6-ft. horizontal displacement—too great if it occurred in the wrong direction.

Rotaries used . . . Three spudders were put to work at first, but after drilling about 10 holes, some of which later had to be redrilled, it became apparent they could not drill them sufficiently straight or rapid. Three small rotary rigs of Pennsylvania Drilling Co. and Buck Theriac Drilling Co. then were hired; they did the job successfully.

In each case an 8¾-in. hole was drilled to about 350 ft. To assure they were being kept vertical, deviation readings were taken at 20 to 40-ft. intervals. More than 700 readings were taken during this work, using a "Totco" (Technical Oil Tool Corp., Ltd.) recording instrument which had a proven accuracy of less than 3.5 minutes. Using this procedure nearly all the wells were drilled with a deviation of less than 0.5°, the horizontal displacement at bottom being 2 ft. or less.

After each hole was drilled, 7-in. casing, with the lower end capped, was run to bottom. In each hole 2½-in. tubing also was run almost to bottom.

The surface end of the tubing then was tied into a brine circulating manifold, with the brine being circulated down the tubing and back through the annular space between the tubing and casing. A compressed ammonia refrigerating unit cooled the brine.

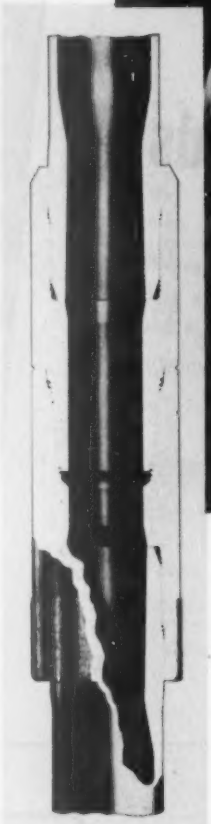
Test hole . . . In order to observe when the formation had been frozen, a test hole was drilled in the center of the shaft site. At the end of 48 days of freezing, the formations were solid to the 350-ft. level. The shaft then was sunk through the water zones without difficulty and the 18 to 22-in. thick concrete liner set while the sands were kept frozen.

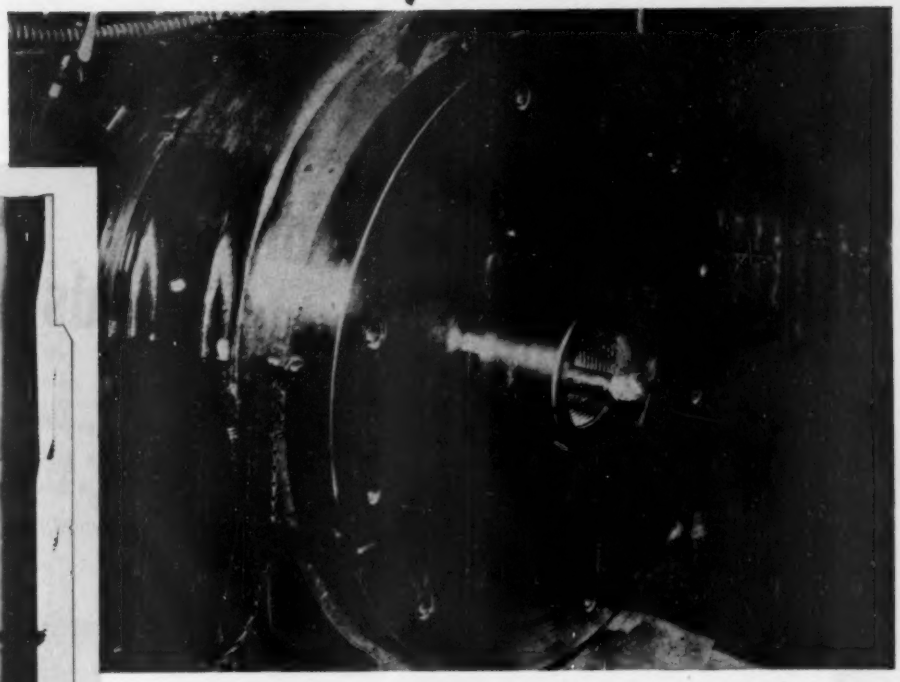
Water, Water, Water Flood

This over-water location shows the water-filtration plant at one of the world's deepest water-flood projects. Seen is the Stanolind Oil & Gas Co.'s operation at Hackberry field, Cameron Parish, southern Louisiana. A closed-type water-handling system is employed. To the right is seen the derrick over the water-supply well. On the left-hand side is seen a water-injection well; the oil formation being flooded is below 10,000 ft. in depth. Photographed as he comes out of door of the water-plant building is G. J. Leloux, first-class mechanic at Hackberry, with Stanolind.

Here's another reason why

REED TOOL JOINTS
last longer!





This hardened and ground adapter is the main reason for the accurate alignment of **REED** Tool Joints. It holds the joint by one set of threads so the remaining machining can be done in accurate alignment.

Perfect alignment prevents the high stresses, uneven wear and whip that could cause drill string failure.

Accurate alignment is another important reason why **REED** TOOL JOINTS LAST LONGER!

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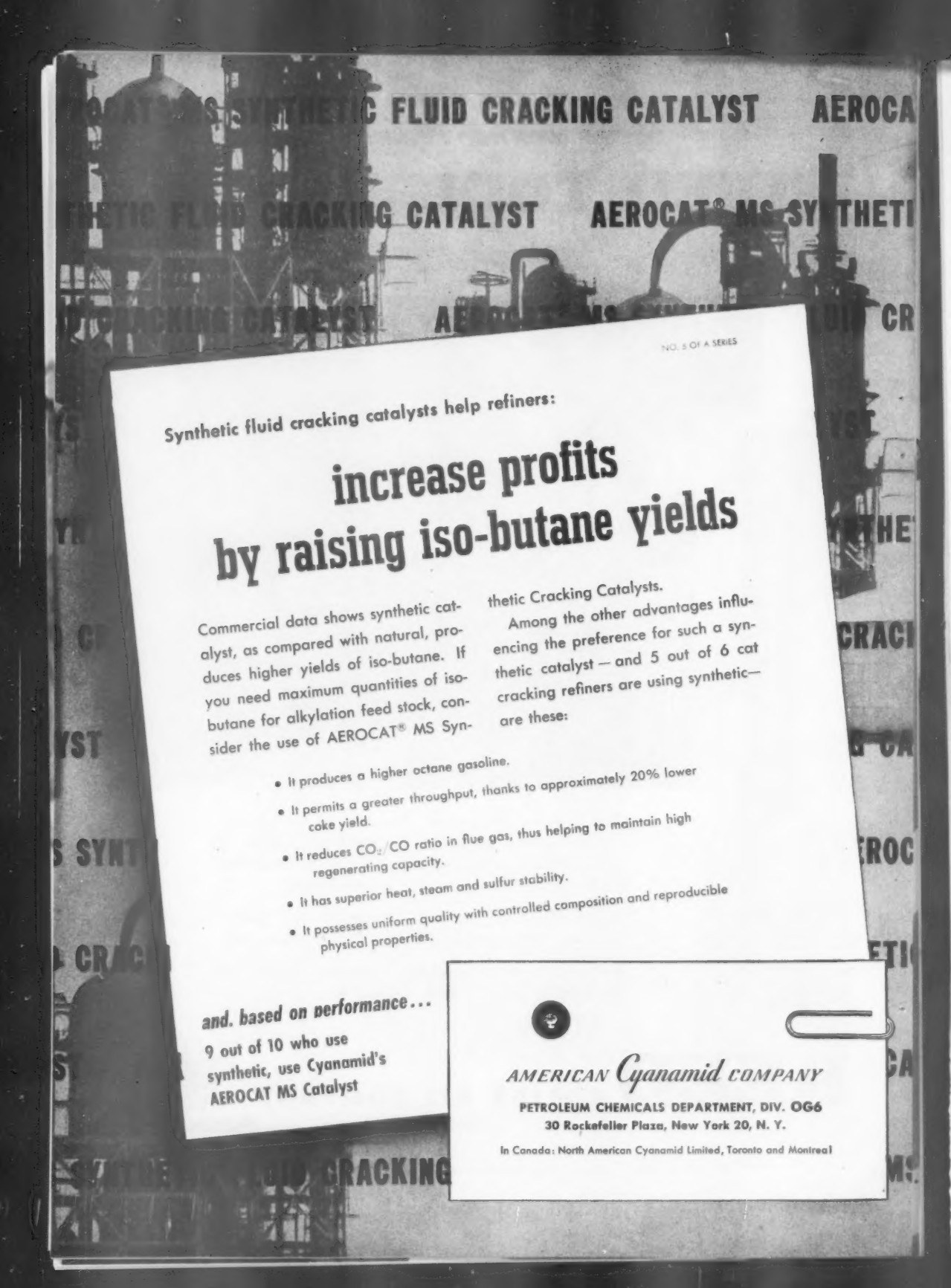

NO. 5 OF A SERIES

Synthetic fluid cracking catalysts help refiners:

increase profits by raising iso-butane yields

Commercial data shows synthetic catalyst, as compared with natural, produces higher yields of iso-butane. If you need maximum quantities of iso-butane for alkylation feed stock, consider the use of AEROCAT® MS Synthetic Cracking Catalysts.

Among the other advantages influencing the preference for such a synthetic catalyst — and 5 out of 6 cat cracking refiners are using synthetic — are these:

- It produces a higher octane gasoline.
- It permits a greater throughput, thanks to approximately 20% lower coke yield.
- It reduces CO_2/CO ratio in flue gas, thus helping to maintain high regenerating capacity.
- It has superior heat, steam and sulfur stability.
- It possesses uniform quality with controlled composition and reproducible physical properties.

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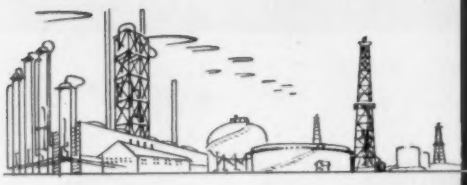

THE JOURNAL'S WEEKLY
Engineering Reference
SECTION

No. 12

PUMPS

Part 12—Rotary Pump Operation

by Gerald L. Farrar
Engineering Editor

OPERATION of reciprocating pumps has been discussed in a previous installment (Part 11). Operation of rotary pumps is discussed here.*

Suction piping . . . Where no static suction lift exists, a quick check to determine whether a suction line is large enough may be made by reference to Fig. 1. Fig. 1 shows the recommended maximum capacity of nonvolatile liquids, which can be handled through an average 10 ft. of smooth standard suction pipe plus two standard elbows and one gate valve. These lines represent a suction pipe friction loss of 7½ psi., equivalent to approximately 15 in. Hg suction lift. If there is a static suction lift or the line is not simple, a large suction pipe will be required.

*This discussion has been taken from the Standards of the Hydraulic Institute, ninth edition, 1951, by permission of the institute.

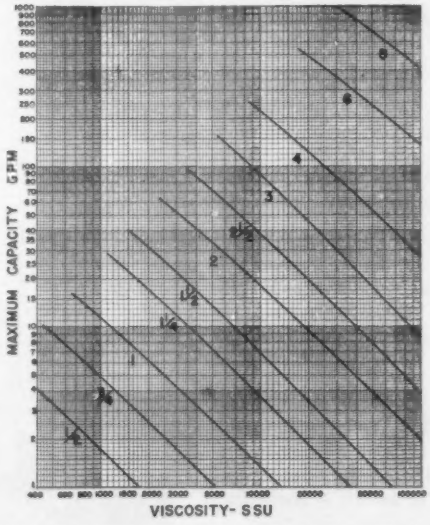

Fig. 1—Size of suction pipe recommended for viscous liquids.

Strainers . . . To prevent the pump from being clogged or damaged by foreign matter, a suction strainer having a net area of at least four times the size of the suction line should be installed. For viscosities over 1,000 S.s.U., use a strainer one or two sizes larger than normal for greater area.

Discharge piping . . . A bypass line containing a relief valve should be installed between pump and discharge gate valve to protect pump in case of accidental closing of discharge valve. The bypass line should be piped back to the source of supply. If conditions will not permit or warrant piping back to the source of supply, the bypass line may be piped back to the suction line, but the line should be carried to a point as near the source of supply as possible. Piping back to the suction is not recommended for the following principal reasons.

When starting the pump, should the relief valve not seat exactly on account of dirt, wear or sticking, the pump would pull through the valve from the discharge line, thereby destroying the "dry lift" or vacuum so that the material would not flow from the source of supply to the pump.

It creates, at the suction of the pump, a disturbance of liquid which is quite likely to reduce the efficiency of the unit.

There is always present the possibility that the pump may operate for appreciable periods with the relief valve open, which causes the liquid to heat, thereby changing the viscosity and lowering the efficiency of the unit.

The relief valve should be set at a pressure slightly above the maximum pressure desired at the pump discharge, and should be of suitable size to relieve at not more than 10 per cent above the maximum pressure for which the pump was sold.

A riser approximately five times the pipe diameter should be installed on the discharge side of pump to prevent gas or air pocketing in pump during idle periods.

It is good practice to put a valve on top or riser to be used as a vent valve and for priming when starting pump. When handling hot oil under some conditions, a bleeder line from the top of the riser will improve pump operation by carrying off the gases which may come over in the material being pumped.

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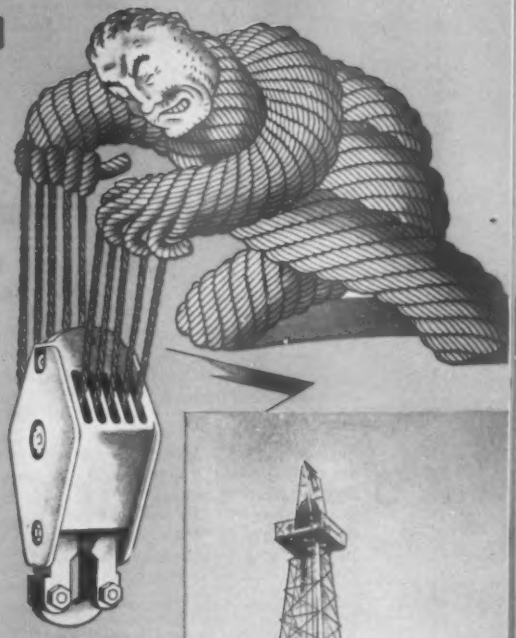

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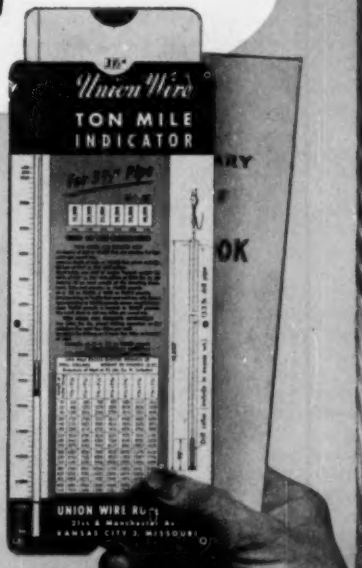

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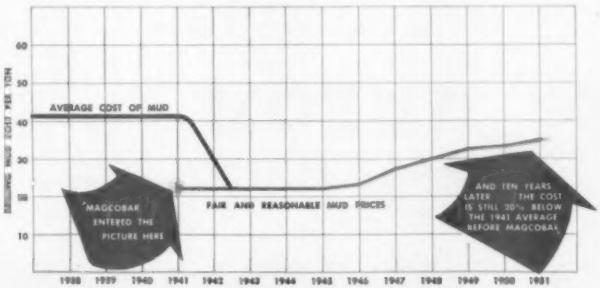
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Oil-Well Cementing Materials—1

by C. D. Saunders* and F. W. Nussbaumer*

UNTIL recently little attention was given to the type of slurry used in oil-well cementing operations. Now, however, cements are "tailor-made" to fit specific well conditions.

In general, improvements have brought about the following changes:

1. Lower or proper strengths
2. Lighter slurry weights
3. Better perforating qualities
4. More volume per sack of cement
5. Better control of lost circulation.

Strengths . . . In the past few years low-strength cements have been accepted by industry. Approximately 500 psi. compressive strength, as tested according to the A.P.I. Code 32, is considered to be the safe minimum strength requirement.

With the acceptance of these lower strengths by the industry, it has been easier to approach the other desirable properties.

Slurry weights . . . The slurry weight of the cement should be variable, to the extent that it can be controlled quite closely, depending on the requirements of the well in which it is being used. In most cases, easier and more satisfactory cementing jobs can be accomplished if the cement slurry weight is only slightly heavier than the drilling fluid being used at the time of the job. The range of weights which have been considered are from about 12½ to 17 lb. per gallon. There may be specific conditions requiring lighter or heavier cements than this, but in general this range seems to satisfy most well conditions.

Better perforating qualities . . . Surface tests show that neat cement cured for 24 hours or more will exhibit cracking when bullet perforated, with more severe shattering occurring as the cement ages and increases in strength. Comparable results have been obtained on subsurface tests made in wells.

This shattering could, in many cases, be sufficient to admit unwanted water and/or gas into the well. By obtaining more resilient or lower-strength cements, the hole formed by the bullet or jet shot should be smooth with little or no cracking.

Better perforating jobs are also accomplished by obtaining greater depths of penetration into the formation. Test results have shown that the lower-strength cements offer less resistance to penetration by bullets or jet shots than conventional cement. Therefore, weaker, more resilient cements would allow deeper penetration into the formation being perforated.

Slurry characteristics . . . One factor which has been overlooked many times in the past has been the slurry characteristics which are controlled primarily by the amount of water used. The two factors which appear to be most important are viscosity and settling of the solid particles from the slurry. These two factors can be controlled by (1) not using less than that amount of water which will give an easily pumpable slurry, or (2) not exceeding that amount of water which will sustain all particles in suspension.

If less than minimum water is used, it is possible for the slurry to be so viscous that the resistance to flow during placement is sufficient to break down weak formations with a loss of slurry. Also, since the water ratio is low, only a small amount of water need be lost, due to loose joints, exposed permeability, etc., before the slurry becomes too viscous to move, causing premature stoppage of slurry placement. The setting and thickening times of these extremely low-water-ratio slurries are considerably shorter than those with the proper amounts of water.

If more than the maximum water is used, settling of the solid particles from the slurry may occur to the extent that free water pockets exist within the cement column. Perforating into such a section would expose all the formation adjacent to the water pocket, which might include formations carrying unwanted water or gas.

Either of the above cases would require remedial cement jobs before the well would be in proper producing condition.

Pumpability . . . The most important consideration concerning pumpability is to have sufficient time to place the cement slurry. Long pumping times are not detrimental, in most cases, if the slurry sets in a reasonable time and the resultant properties of the set cement are satisfactory. Since low strengths are being accepted, longer and better controlled pumping times can be obtained. The pumping time varies with the amount of water used, and is somewhat longer with the higher ratios.

Control of lost returns . . . One of the most troublesome well problems encountered when cementing is not being able to place material to the desired height behind the casing because of loss of cement slurry into thieving formations. This condition may be caused by the formation being of a porous or fractured nature such that the slurry will be lost into it rather than rise in the annulus. Another, and probably more common, cause of lost circulation is weak formations which the hydrostatic head of the cement slurry is sufficient to break down with a loss of slurry into induced fractures. To eliminate this condition, lighter slurry weights and the use of bringing materials of various types are required.

*Halliburton Oil Well Cementing Co.
Summary of paper presented at A.P.I. production meeting, Mid-Continent district, Wichita, March 19-21.

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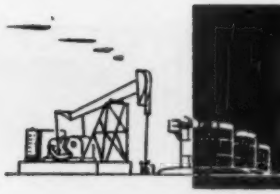


How to Measure Gas Flow

by Ralph F. Nielsen*

THE methods of measuring the flow of gas, aside from those involving displacement of a mechanical device, depend upon interconversion of potential and kinetic energy. Equations governing the use of these methods of measurement may therefore be derived by starting with an appropriate form of Bernoulli's theorem (Engineering Fundamentals No. 480):

$$\frac{dP}{s} + \frac{u\,du}{g} = 0 \qquad (1)$$

$$\frac{P_1}{s_1} + \frac{u_1}{2g} = \frac{P_2}{s_2} + \frac{u_2}{2g} \qquad (2)$$

The venturi meter (see Fig. 1)

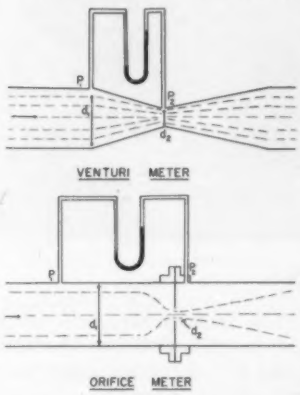


Fig. 1

is designed to give a minimum of pressure loss. However, because of its cost and the cost of repair or replacement when the internal surface becomes rough, it is not used nearly as much as the orifice meter. In the case of the venturi meter the expansion associated with the pressure drop at the throat is nearly adiabatic and reversible. It was pointed out in Engineering Fundamentals No. 485 that for such a process, if the gas laws are obeyed, we may write:

$$PV^k = P_1V_1^k = P_2V_2^k \qquad (3)$$

or

$$T_1/T_2 = (V_2/V_1)^{k-1} = (P_1/P_2)^{(k-1)/k} \qquad (2)$$

The equation for the venturi meter may therefore be derived by integration of Equation 1, after substituting for V from Equation 3. This gives:

$$\frac{kP_1}{(k-1)\,s_1}\left[1 - (P_2/P_1)^{(k-1)/k}\right] = \frac{u_2^2 - u_1^2}{2g} \qquad (5)$$

Since T_2 and hence u_2 are not known directly, this equation is put into a usable form by factoring out u_2^2 and noting that:

$$u_1/u_2 = (d_2/d_1)^2\ (P_2/P_1)\ (T_1/T_2)$$

Furthermore (Engineering Fundamentals No. 482):

$$s_1 = \frac{29\,GP_1}{1{,}544\,Z_1T_1},\quad u_2 = Q\frac{14.7 \times 144 \times 4 \times 144 \times T_2Z_2}{520 \times 86{,}400\,d_2^2P_2},\quad g = 32.2 \qquad (6)$$

Substitution of these values and the value of T_2 from Equation 4 gives, on solving for Q:

$$Q = 0.97 \times 10^6\ d_2^2\ p_1R^{1/k}\left[\frac{k}{(k-1)\,GT_1Z_1}\,\frac{1 - R^{(k-1)/k}}{1 - R^{2/k}r^4}\right]^{1/2} \qquad (7)$$

where Q is cu. ft. per day at 14.7 psia. and 60° F., p is in psia., R is the ratio P_2/P_1, and r is the ratio d_2/d_1. An experience factor within 1 or 2 per cent of unity may be supplied by the manufacturers or obtained by testing. For a dry natural gas k is about 1.27.

In the case of the orifice meter the process cannot be regarded as one of reversible expansion. The simplest mathematical treatment is similar to that applied to a hole in a tank of liquid, with adjustments by use of "experience factors." Thus, taking Bernoulli's theorem in the form of Equation 2 and assuming the pressure drop small enough so that s may be regarded as constant:

$$2g\,(P_1 - P_2) = s\,(u_2^2 - u_1^2) \qquad (8)$$

If $r = d_2/d_1$ (see Fig. 1) and $h = P_1 - P_2$ in inches of water, then $u_1^2/u_2^2 = r^4$ and $P_1 - P_2 = 62.4h/12$, while s, u, and g are given by Equation 6. Solving for Q gives:

$$Q = 1.85 \times 10^5\,\frac{d_2^2}{(1-r^4)^{1/2}}\,(hp/GTZ)^{1/2} \qquad (9)$$

where p is in psia. This formula is not used in practice. Tables published by manufacturers are for standard locations of the pressure taps, such as "flange taps," "pipe taps," etc. The pressure is a minimum at the point of greatest contraction of the stream lines, the "vena contracta," slightly beyond the orifice. From this point the pressure increases, but the upstream pressure P_1 is not recovered as fully as it is in the case of the venturi meter. The numerical constant and the factor containing d_2 and r may be included in a single constant c so:

$$Q = c\,(hp/GTZ)^{1/2} \qquad (10)$$

where c is determined by calibration or taken from handbooks.

Tables usually give a series of factors such that:

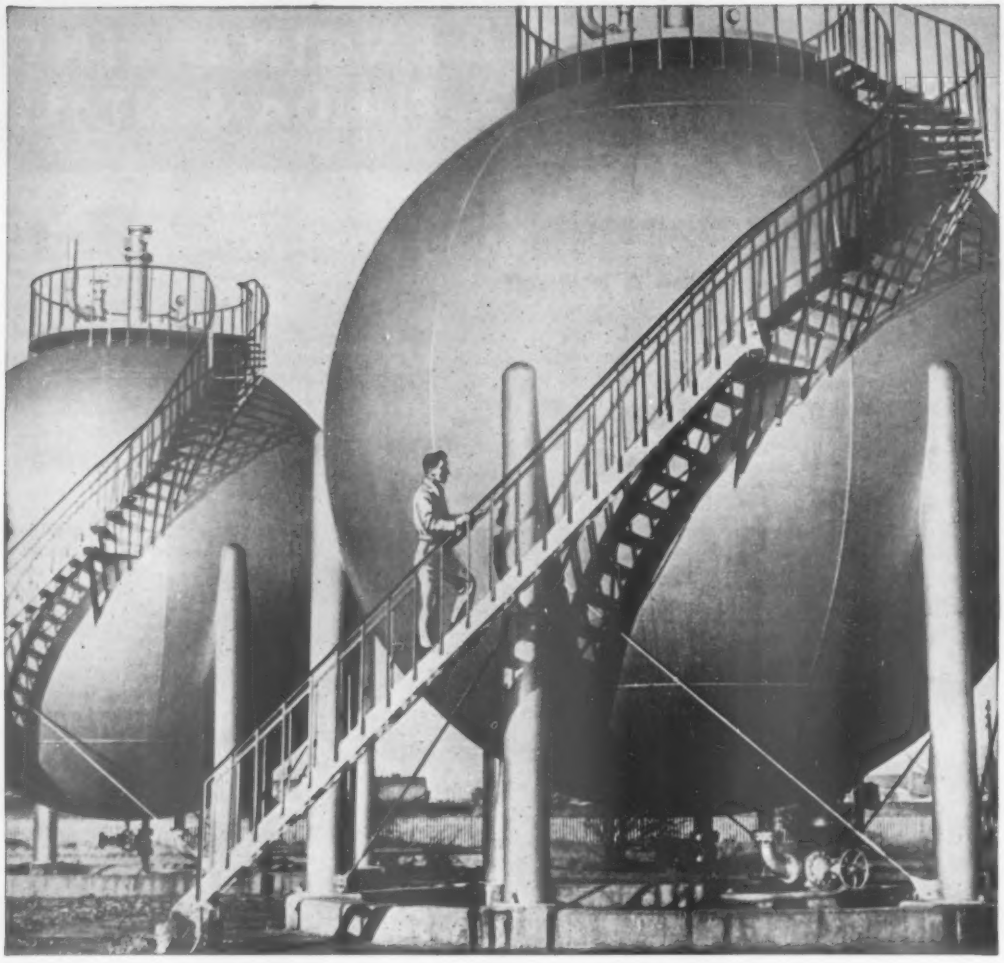
$$Q = F_1F_2F_3 \ldots (hp)^{1/2} \qquad (11)$$

where one of these is the basic orifice constant and the others correct for flowing temperature, gravity, Reynolds number, etc., and are unity for specified values of these quantities. Various precautions on installations are also given in handbooks.

Reference

Gas Engineer's Handbook, McGraw-Hill.

*Associate professor, petroleum and natural gas engineering, Pennsylvania State College.



GLOBAL OPERATIONS . . .

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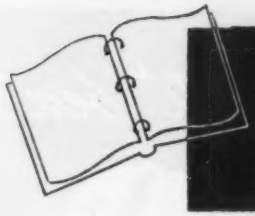

How to Figure Pressure Drop...

... when back-pressure relief valves are used

by S. Chesler* and B. W. Jesser†

Part 3. Numerical Examples

IN Installment No. 126, Refiner's Notebook, equations were presented by which pressure drop can be figured when back-pressure relief valves are used.

The temperature at the end of the pipe, obtained from the ideal gas law and Equation 5 of Installment No. 126, for adiabatic flow, is given by:

$$T_2 = T_1\left(\frac{P_2}{P_1}\right)\left(\frac{\rho_1}{\rho_2}\right) = T_1\left[1-\left(\frac{k-1}{2k}\right)\frac{G^2}{gp_1\rho_1}\left\{\left(\frac{\rho_1}{\rho_2}\right)^2 - 1\right\}\right]$$

The critical velocity for adiabatic flow is represented by the expression:

$$V_c = 68\ (kP_c/\rho_c)^{1/2}$$

The following example is presented in order to illustrate the use of the given equations as well as to compare the results obtained for the isothermal, the adiabatic and the average density methods.

A 16-in. Schedule 30 pipe 1,600 ft. long, is to handle 440,000 lb. per hour of vapor whose M = 48. The pipe inlet conditions are P_1 = 75 psia. and T_1 = 625° R., k = 1.2, viscosity = 0.01 cp. Estimate the total pressure drop in the line.

Isothermal Solution

$$\rho_1 = \frac{MP_1}{10.73T_1} = \frac{48 \times 75}{10.73 \times 625}$$

$$= 0.536 \text{ lb. per cu. ft.}$$

Friction loss based on upstream conditions and the Fanning equation is equal to 28.8 psi. = ΔP_E:

$$\frac{\Delta P_E}{P_1} = \frac{28.8}{75} = 0.384$$

*Piping engineer and †head, piping analytical section, M. W. Kellogg Co. From paper presented at A.S.M.E. Toronto meeting, 1951.

$$5.594 \times 10^{-7}\ \frac{W^2}{D^4P_2\rho_1}$$

$$= \frac{5.594 \times 10^{-7} \times (4.4 \times 10^5)^2}{15.25^4 \times 75 \times 0.536} = 0.0498$$

Enter Fig. 1 of No. 127, Refiner's Notebook (June 16, 1952) at $\Delta P_E/P_1$ = 0.384 and go up to the curve that corresponds to 0.0498 and then horizontally to the left or right and read C_E = 1.670.

Hence the corrected (actual) pressure drop $\Delta P = C_E \times \Delta P_E = 1.670 \times 28.8 = 48.2$ psi.

Outlet pressure = 75 — 48.2 = 26.8 psia.

Adiabatic Solution

Since charts are not available at present, a numerical approximation can be obtained directly from Equations 4 and 5, No. 126, Refiner's Notebook.

Note that the right-hand member of Equation 4, No. 126, is equal to $2\Delta P_E/P_1 = 2 \times 0.384 = 0.768$. The coefficients of the left-hand member of this equation are easily calculated since k is known and $G^2/(gp_2\rho_1)$ is equal to 0.0498.

Thus:

$$[(k-1)/2k]\ \frac{G^2}{gP_2\rho_1} = 0.0041$$

and

$$[(k-1)/2k]\ \frac{G^2}{gP_1\rho_1} = 0.0454$$

For these values of the coefficients a value of $\rho_1/\rho_2 = 2.62$ provides a good approximation to the solution of Equation 4, No. 126.

Substituting this value in Equation 5, No. 126, one obtains:

$P_2/P_1 = 0.373$ or $P_2 = 0.373 \times 75 = 28.0$ psia. = outlet pressure.

Hence, $\Delta P = 75 - 28.0 = 47.0$ psi.

Using Equation 6, No. 126, $T_2 = 625 \times 0.373 \times 2.62 = 610°$ R., a drop of 15° in temperature.

Solution based on the average density in the line: leads to a total pressure drop of 38.5 psi.

The above results show that the isothermal and adiabatic solutions are of the same order of magnitude, whereas, the solution based on the average density in the line is seen to be about 25 per cent in error.

Open Systems

The decision between an open or closed relief valve system is many times an arbitrary one based on local conditions, past practices, and the general feelings of the person or persons making the decision. There is very seldom any concrete fact on which one can hang his respective hat. Recently, however, this problem has been attacked by making use of the theoretical equations for the dispersion of gases from tall stacks as developed by Bosanquet-Pearson[1] and Sutton.[2] These theoretical equations have been applied by Thomas, Hill, and Abersold[3] to a large number of field measurements in which the ground concentrations of SO_2 gas released from tall stacks was determined. Very good agreement with the theory has been indicated. Use of these equations will be taken up in future installments.

References

1. Bosanquet, C. H., and J. L. Pearson, Trans. Faraday Soc., Vol. 32, p. 1249 (1936).
2. Sutton, O. G., Royal Meteorological Soc. Quart. J., Vol. 73, p. 426 (1947).
3. Thomas, M. D., Hill, G. R., and J. N. Abersold, Ind. and Eng. Chem., Vol. 41, p. 2409 (1949).

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by W. L. Nelson
Technical Editor

QUESTIONS ON TECHNOLOGY

Vapor-Phase Cracking—A Means of Reducing Fuel-Oil Yields

"We hear little of vapor-phase cracking. I understand it produces less fuel oil and hence I wonder if it would be a useful process today?" —S.M.H.

Vapor-phase or high-temperature cracking is practiced little today for the production of gasoline, but it is the process by which enormous amounts of ethylene and propylene are being made in the petrochemical industry. Reforming operations are also vapor-phase processes but they are conducted at 960°-1,020° F., rather than the temperatures of 1,150° F. once used for gasoline production or the 1,300° F. and higher temperatures used in Gyro vapor-phase cracking for gas production (ethylene, etc.). The failure to properly develop vapor-phase cracking is probably the main reason that few gasoline producing plants are now operating.

When cracking at 1,150°-1,200° F. for gasoline, the gas production is large (1,000-1,400 cu. ft. per barrel) but the yield of cracked fuel oil is low. The gas contains very large amounts of olefins, and when these are polymerized into gasoline, the total gasoline yield is larger than by the conventional mixed-phase cracking processes. The gasoline yields when cracking light gas oils or distillates (22°-32° A.P.I.) can be computed from the following equation:

$$\text{Gasoline (400° e.p.—10 lb. R.v.p.)} = 23 + 1.4\,(A_s - A_r)$$

or when poly gasoline is included:

$$\text{Gasoline} = 28 + 1.65\,(A_s - A_r)$$

in which:

A_s = A.P.I. gravity of cracking stock.

A_r = A.P.I. gravity of cracked fuel oil.

Thus, 5 to 9 per cent more cracked and poly gasoline (based on gasoline yield) can be obtained by vapor-phase cracking than by conventional mixed-phase cracking. Without the poly gasoline, the yield by vapor-phase cracking is 3 to 7 per cent less than by conventional cracking. The "unaccounted for liquid volume per cent" in vapor-phase cracking (without polymerization) is:

$$\text{Unaccounted for} = 1.15\,(A_s - A_r)$$

which is about two and one-half times larger than the "unaccounted for" precentage in conventional cracking.

TABLE 1.—YIELDS WHEN CRACKING IN THE VAPOR PHASE

WITH POLYMERIZATION

	26° A.P.I. feed		30° A.P.I. feed	
Liquid vol. per cent—	Vapor phase	Mixed phase	Vapor phase	Mixed phase
Gaso. (400° e.p.—10 R.v.p.)	62.6	60.4	69.2	65.5
Cracked fuel (5° A.P.I.)	24.5	32.9	13.2	25.7
Total liquid	87.1	93.3	82.4	91.2
Weight per cent—				
Gas	19.8	12.0	25.4	13.9

WITHOUT POLYMERIZATION

	26° A.P.I. feed		30° A.P.I. feed	
Liquid vol. per cent—	Vapor phase	Mixed phase	Vapor phase	Mixed phase
Gaso. (400° e.p.—10 R.v.p.)	52.7	57.0	58.0	61.8
Cracked fuel (5° A.P.I.)	24.5	32.9	13.2	25.7
Total liquid	77.2	89.9	71.2	87.5
Weight per cent—				
Gas	28.2	14.4	34.7	16.8
Gas—cu. ft. per bbl.	1,120	575	1,350	653

TABLE 2—YIELDS WHEN CRACKING 20° A.P.I. OILS BY VAPOR-PHASE CRACKING

Liquid vol. per cent—	Mixed phase	Vapor phase*
Gaso. (400° e.p.—10 R.v.p.)	48.6	53.7
Cracked fuel (5° A.P.I.)	47.3	36.1
Weight per cent—gas	8.8	18.2

*Viscosity breaking 20° A.P.I. feed into 70 per cent (26° A.P.I.) gas oil, and cracking the 26° A.P.I. stock by vapor-phase cracking. All gases are polymerized.

These relationships may be compared in Table 1 which shows yields when cracking 26° and 30° A.P.I. stocks. When processing low-gravity feed stocks by vapor-phase cracking it is necessary to reduce the boiling range of the asphaltic materials so that they can be vaporized in the vapor-phase process. Thus, when cracking a 20° A.P.I. residual stock, the stock is first viscosity broken into 26° A.P.I. or lighter gas oil, and small amounts of gasoline, gas, and fuel oil. The 26° A.P.I. stock can then be cracked under vapor-phase conditions. The overall yields from such a combined operation, including also the polymerization of gases, is shown in Table 2.

In addition to the larger gasoline yields, the vapor-phase gasoline has a motor-method octane number of 73-75, and at least the ethylene part of the cracked gas can be recovered.

Wet Steam for Pumps

"How can I figure the steam consumption of pumps when the 'quality' of the steam is 98 per cent?"—R. E. B.

The deleterious effect of moisture in low-quality steam is not a figure that can be computed mathematically. It must be learned by the operation of pumps, and is subject to great variations because of differences in their mechanical construction.

Moisture collects on the walls of the cylinders and must run down to drainage or vent points. Thus, whereas 98 per cent quality steam causes a direct loss of only about 2 per cent of the steam, a much larger loss occurs by the venting of the cylinders. With one very large (30-in.-diameter cylinder) power pump it was found that almost as much steam had to be vented as that required for power. This was an unusual case, caused primarily by the very large cylinder diameter. The only reference that is readily at hand is H. P. Henderson (Worthington Pump & Machinery Co.) on page 309 of the Petroleum Engineer reference annual.

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Close up view of Adjustocrank on Happy TS—160—A Pumping Unit

Management, production superintendents, maintenance crews, pumpers and safety engineers tell us the new *HAPPY single reduction, high ratio pumping units* with HAPPY'S ADJUSTOCRANK is the ultimate in desirable crank design.

Excluded in the original design of the HAPPY ADJUSTOCRANK were machined joints, racks and pinions, and all other design features which would cause heavy weights to slip, flip wrenches, or require hand bars, sledges or other tools and extra men to adjust the position of the movable weights.

THE HAPPY ADJUSTOCRANK IS PERFECTLY SAFE FOR ADJUSTMENT OF WEIGHTS AT ANY ANGLE POSITION OF THE CRANK.

- **A round 3" steel bar guides in-or-out movement of weights.**
- **Desired weight position is actuated by a long acme threaded screw.**
- **Only one man and one wrench are required to adjust weights.**
- **Outer orbit of crank has floor clearance of three inches or more.**
- **ADJUSTOCRANKS with BEAM WEIGHTS—the real answer to counter balancing.**

For your pumping requirements, call your nearest HAPPY representative, he can serve you NOW.

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Safety Switches
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Dallas ..... Texas
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Pampa ..... Texas
Wichita Falls ..... Texas
Wichita ..... Kansas

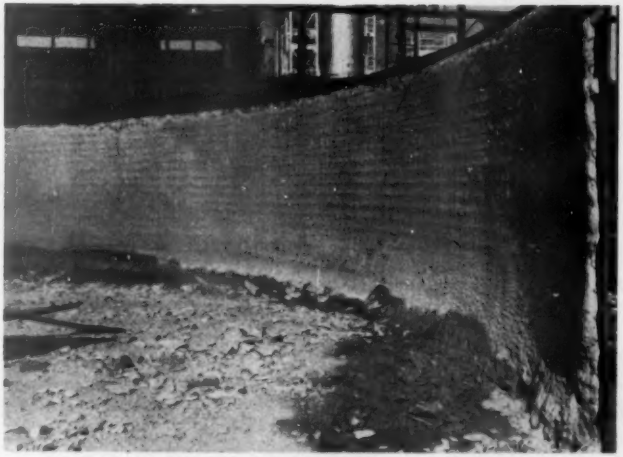

Fig. 1—Gunite lining after 6 years of service.

Experience With Gunite Linings

BASED on approximately 100 installations, reinforced gunite protection has proved effective and remarkably free from maintenance. Early unreinforced linings, which were of ¼-in. thickness only, were subject to spalling. However, with the adoption of lining reinforcement and consequent greater thickness, spalling was practically eliminated, and complete metal protection was assured. Average reinforced-lining experience is for a period of 9 years, with a few installations satisfactory after 12 years of service.

Inspection records show only two failures, viz.: one exposing tank plates, and one exposing the reinforcing only. It is believed that these failures were caused by thermal stresses produced when cold tanks were steamed during gas-freeing. It is necessary to repair the break caused by removal of door sheets when an inspection is made. This repair work is all that has been required to maintain reinforced gunite protection in storage tanks, with the two exceptions previously noted.

In 1948 an obsolete rundown tank, with its entire interior protected by reinforced gunite, was dismantled. The condition of the lining after 6 years' service is shown in Fig. 1, which discloses no noticeable deterioration of the surface. Fig. 2 pictures the crown sheet from the same tank with gunite removed, and it illustrates the absence of corrosion.

The dismantling of a rundown tank, which had been lined for more than 10 years, is shown in Fig. 3. This photograph illustrates the bond which exists between steel and gunite after such service.

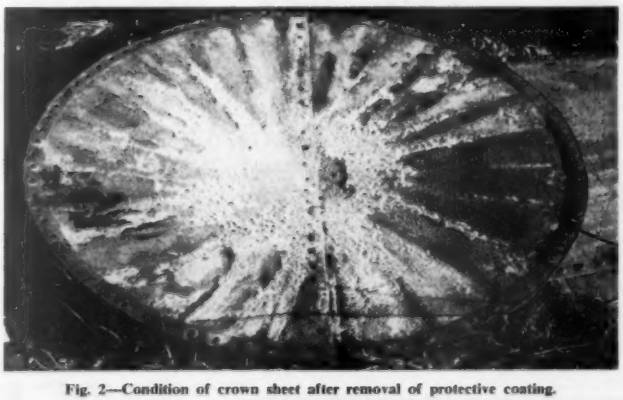

Fig. 2—Condition of crown sheet after removal of protective coating.

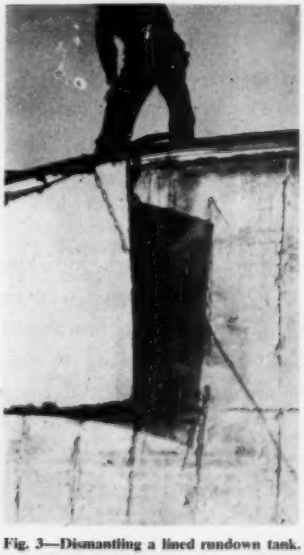

Fig. 3—Dismantling a lined rundown tank.

PRICE PIPELINE PORTRAITS

G. A. "ABE" REUTZEL
Superintendent, Spread 1

The men who work for Abe Reutzel, veteran of 22 years pipelining experience, know there's no problem too tough for "the boss". He started on the line at 19... became a top-notch welder... worked his way up through the ranks. Today he captains a million-dollar crew of men and machines in a constant race against Time and the Elements, forging important links in the nation's vital pipeline system. Reutzel, a solid family man with a keen interest in community affairs, typifies the capable, smooth-functioning spread superintendent who helps make H. C. Price Co. 'America's Foremost Pipeline Constructors'.

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H. C. PRICE CO.

PHILADELPHIA · BARTLESVILLE · NEW ORLEANS

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Pipe-Line Construction

FOLLOWING is a tabulation of pipeline projects which are planned or under construction. Included are crude-oil, products, and natural-gas lines. This list is compiled from surveys made by The Oil and Gas Journal.

Crude-Oil Pipe Lines

Cities Service Pipe Line Co.—64 miles, 18-in., planned, Sour Lake, Tex., to Lake Charles, La. Completion date 1-1-53.

19 miles, 8-in., under way, Cushing to Guthrie, Okla. Gragg Const. Co. Completion date 6-1-52.

Continental Pipe Line Co.—105 miles, 8-in., contracted, Rincon to northwest of Sullivan City on to Port Isabel, Tex. Western Const. Co. Completion date 9-30-52.

217 miles, 12-in., authorized, Wichita Falls, Tex., to Ponca City, Okla. Completion date 1952.

Cooperative Refinery Association.—48 miles, 6-in., authorized, Phillipsburg, Kans., to Holdredge, Neb.

Gulf Refining Co.—80 miles, 24-in., authorized, Midland to Colorado City, Tex.

22 miles, 10-in., authorized, Wortham to Corsicana, Tex.

Humble Pipe Line Co.—4, 6, 8, 12-in., proposed, Upton and Reagan counties, Texas.

201 miles, 12-18-in., planned, Hawkins to Baytown, Tex.

Interstate Oil Pipe Line Co.—30 miles 16-in., authorized, Moore to Flora, La. Completion date 1953.

68 miles, 16-in., authorized, Raceland to Anchorage, La. Completion date 11-52.

18 miles, 12-in., authorized, LaRose to Raceland, La. Completion date 10-52.

55 miles, 16-in., authorized, Sunset to Anchorage, La. Completion date 12-52.

21 miles, 12-in., planned, Duck Lake and Bayou Sale to New Iberia, La. 9-52.

63 miles, 12-16-in., planned, Flora to Bunkie, La. Completion date 12-31-52.

42 miles, 4-6-10-in., planned, Esperance Pt., Fairview and Lisemore Landing, La., to Cranfield, Miss., Latex of Georgia. Completion date 8-15-52.

Malco Refineries, Inc.—60 miles, 4-in., under way, Pettigrew, Tocito field to Hospah field (San Juan basin, New Mexico).

Pan American Pipe Line Co.—27 miles, 26-in., planned, Genoa to Texas City, Tex. Completion date 12-52.

40 miles, 14-in., planned, Arden Station in Irion County to Eldorado Station in Schleicher County, Texas. 6-52.

Pasotex Pipe Line Co.—195 miles, 8-in., under way, El Paso to Wink, Tex.

Platte Pipe Line Co.—1,075 miles, 16, 20-in., under way, Worland, Wyo., to Wood River, Ill. Completion date 1952.

573 miles, 16-20-in., under way, Worland, Wyo., to Holdredge, Neb. R. H. Fulton & Co., contractor. A. A. Carrigan, spreadman at Scotts Bluff, Neb.

142 miles, 20-in., under way, Holdredge, Neb., to Kansas State Line, Fulton & Brodie, contractor, J. T. Brodie, spreadman.

Section 7. 274 miles, 20-in., Missouri River to Salisbury, Mo., and Section 8, Salisbury to Mississippi River, under way. O. R. Burden Construction Co. Al Perry, spreadman at Carrolton, Mo.; river crossing field office, Hartford, Ill. Dick Jernigan, spreadman.

Progress Pacific Pipe Line Co.—900 miles, 20-in., proposed, Permian basin, West Texas to California.

Rancho Pipe Line System.—455 miles, 24-in., authorized, McCamey to Houston, Tex. Completion date late 1952. (Joint project with Sinclair Pipe Line Co., Pan American Pipe Line Co., Tidewater Pipe Line Co., Nantucket Pipe Line Co., Phillips Pipe Line Co., and Ashland Pipe Line Co. with Shell Pipe Line Corp. handling construction and operation.)

267 miles, contracted, McCamey to Cedar Valley near Austin, Tex. Anderson Bros. Corp.

190 miles, 24-in., contracted, Austin to Shell's Deer Park Refinery (Houston area).

68 miles, 24-in., under way, Deer Park refinery west to Brazos River. Oklahoma Pipe Line Constructors, contractor. Spread 1—Louis Visentine, Pasadena, Tex.; Spread 2—Raymond Law, 1100 Old Spanish Trail, Houston.

126 miles, 24-in., under way, Brazos River west to Austin. Houston Contracting Co.

Roosevelt Oil & Refining Corp.—22 miles, 4 and 6-in., authorized, St. Helens to Norwich, Mich.

Service Pipe Line Co.—33 miles, 16-in., planned, Bowie, Tex., to Drumright, Okla.

30 miles, 6-in., Knox and Haskell counties, Texas.

29 miles, 4, 6, 8-in., proposed, Natrona County, Wyoming.

Shell Oil Co.—276 miles, 14-in., under way, Wood River, Ill., to Chicago. R. B. Potashnick, contractor. Chester Kinkead, spreadman at Peotone, Ill Completion date 10-52.

Shell Pipe Line Corp.—42 miles, 8-in., authorized, Halletsville to LaGrange, Tex. Completion date 7-1-52.

Sinclair Pipe Line Co.—674 miles, 22, 24-in., under way, Drumright, Okla., to East Chicago, Ind. Completion date 1952.

Section 1—150 miles, 24-in., under way, Drumright-Cushing, Okla., area, to Humboldt, Kans. O. R. Burden Construction Co.

(Spread) 1) 60 miles, 24-in., under way, Caney to Humbodlt, Kans. A. B. Haynes, superintendent, at Chanute, Kans.

(Spread 2) 90 miles, 24-in., under way, Cushing, Okla., to Caney, Kans. Floyd Lewis spreadman at Hominy, Okla.

184 miles, 24-in., under way, Humboldt, Kans., to Salisbury, Missouri. R. H. Fulton & Co., contractor, M. L. Boyd and Jerry Nash, spreadmen.

176 miles, 22-in., under way, Salisbury, Mo., to Forest City, Ill. O. R. Burden, contractor.

Southern California Edison Co.—41 miles, 8-in., under way, Etiwanda to Santa Fe Springs, Calif. J. E. Young Pipe Line Contractors, Inc. Jack Cook, spreadman. Completion date 10-15-52.

Sterling Pipe Line System.—53 miles, 12-in., authorized, Sterling, Colo., to connection with Platte Pipe Line at Gurley, Neb. (Includes 20 miles, 10-in., main line; 35 miles, 8-in., branch lines.) Joint venture comprising Toronto Pipe Line Co., Shell Pipe Line Corp., and Texas Pipe Line Co.

Sun Pipe Line Co.—99 miles, 4, 6, 8-in., proposed, Scurry County, Texas.

34 miles, 8-in., planned, Jameson to Colorado City, Tex.

20 miles, 8-in., authorized, Claytonville to Colorado City, Tex. Completion date 11-1-52.

Texas Pipe Line Co.—319 miles, 22, 12, 10-in., under way, Louisiana Gulf Coast to Port Arthur, Tex.

175 miles, 16-in., under way, Corsicana to

EXPANSIBLE INTERNAL PIPELINE CLEANER

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East Houston, Smith Contracting Corp. Frank Craig, spreadman at Teague, Tex. Completion early summer.

86 miles, 22-in., under way, Gueydan east to Morgan City, La. Houston Contracting Co. F. A. Silar, superintendent at Abbeville, La.

65 miles, 6, 8, 10-in., under way, and 30 miles, 12-in., Houma, La., south through Terrebonne Bay vicinity. Houston Contracting Co. H. L. Leake, superintendent at Houma

Toronto Pipe Line Co.—100 miles, 6-10-12-in., authorized, Merino, Colo., to Gurley, Neb. Completion date 10-31-52.

West Coast Pipeline Co.—986 miles, 20-22-in., planned, Snyder, Tex., to Norwalk, Calif.

West Texas Gulf Pipe Line Co.—466 miles, 26-in. under way, Colorado City, Nederland, Tex., Anderson Bros.

112 miles, 20-in., planned, Wortham-Longview, Tex.

22 miles, 10-in., planned, Wortham-Corsicana, Tex.

79 miles, 24-in., planned, Midland-Colorado City, Tex.

Products Pipe Lines

Bell Oil & Gas Co.—150 miles, 6-in., planned, Ardmore to Drumright, Okla. (Includes 114 miles, 8-in., 32 miles, 6-in.) Completion date 6-1-53.

Buckeye Pipe Line Co.—370 miles, 8, 12, 16-in., authorized, Linden, N. J., via Allentown, Pa., to Auburn, Syracuse, Waterloo, and Rochester, N. Y. (Sections divided as follows: 75 miles, 16-in., 218 miles, 12-in., 77 miles, 8-in.). Completion of 16-in., 1952, balance 1953.

Coastal Products Pipe Line Co.—260 miles, 20-in., proposed, Houston to Baton Rouge.

Derby Oil Co.—30 miles, 4-in., under way, Wichita to Bell, Kans. Completion date 7-1-52.

Gulf Refining Co.—78 miles, 8-in., under way, Port Arthur to Deer Park, Tex., Glaser Const. Co., Barry Const. Co.

28 miles, 8-in., under way, El Vista to Orange, Vawter Const. Co., I. R. Stewart Const. Co.

Keystone Pipe Line Co.—60 miles, 12-in., proposed, Pt. Breeze, Pa., to Montello, Pa. Completion date 12-31-52.

Ohio Oil Co.—255 miles, 8, 10-in., proposed, East St. Louis, Ill., to Indianapolis. Conyes Const. Completion date 11-52.

Phillips Petroleum Co.—50 miles, 8-in., authorized, Goldsmith to Spraberry, Tex. Completion date 11-52.

35 miles, 6-in., authorized, Okmulgee, Okla., to Tulsa. Smith Contracting Co. Completion date 10-52.

68 miles, 12¾-in., under way. Osawatomie westward to Wichita, Kans. Brown Lite Co. R. E. Carriker, spreadman at Osawatomie, Kans.

40 miles, 10-in., through Monteau, Cole, Osage, and Gasconade counties, Missouri. Trojan Const. Co. E. L. Maggard, spreadman at Linn, Mo.

Under way, Paola, Kans.-Harrisonville, Mo. Smith Contracting Corp.

74 miles, 8-in., under way, looping from Decatur, Ill., to East Chicago, Ind. Somerville Const. Co., contractor.

137 miles, 10-in., authorized, looping from Paola, Kans., to East St. Louis, Ill.

Pioneer Pipe Line Co.—(Continental Pipe Line Co. and Sinclair Pipe Line Co.). 310 miles, 8-in., under way, Sinclair, Wyo., to Salt Lake City, Utah.

Progress Pacific Pipe Line Co.—900 miles, 10-in., proposed, California to West Texas.

Salt Lake Pipe Line Co.—Proposed, Pasco, Wash., to Puget Sound.

330 miles, 8-in., planned, Salt Lake City, Utah, to, Boise, Idaho. Completion date 12-1-52.

Shell Oil Co.—565 miles, 8-14-in., under way, Wood River via East Chicago to Detroit; 35 miles, 14-in. R. B. Potashnick, contractor. Completion date summer of 1952.

Sinclair Pipe Line Co.—10-in., Houston to Baton Rouge; 16-in., Kalamazoo to Detroit; 20-in., Marcus Hook to Bayonne, N. J.; East Chicago to South Bend, Ind.

8-10-in., planned, Sinco to Port Arthur, Tex.

Standard Oil Co. (Ind.).—316 miles, 12-in., proposed, Sugar Creek refinery to Dubuque, Iowa. Completion date 1-1-53.

Standard Oil Co. (Ohio).—17 miles, 6-in., authorized, Toledo to West Toledo, Ohio.

Sun Pipe Line Co.—110 miles, 8-in., under way, Fostoria to Hudson, Ohio.

Susquehanna Pipe Line Co.—123 miles, 6, 8-in., proposed, Fostoria to Randolph, Ohio.

Tuscarora Oil Co.—74 miles, 6-10-12-in., under way, Allentown to Midland, Pa.

United States Pipe Line Co.—1,000 miles, proposed, Gulf Coast via Memphis, Nashville, Tenn., Lexington, and Paducah, Ky., to Cincinnati, Ohio.

Natural-Gas Pipe Lines

Algonquin Gas Transmission Co.—160 miles, 24-26-in., under way, New Jersey to Connecticut River near New Haven. Williams Brothers, contractor. Robert L. Buck, project manager, Danbury, Conn. Spreadmen: Thelmer Davis, Waterbury, Conn., O. L. Martin, Sloatsburg, N. Y., O. R. Mitchell, Danville, N. J. Completion date 8-1-52.

270 miles, under way, New Jersey, Connecticut, Rhode Island, and Massachusetts. Completion date 9-1-52.

Allied Gas Co.—24 miles, 6⅝-in., proposed, McLean to Champaign County, Illinois.

Arkansas-Missouri Power Co.—140 miles, 2-10-in., planned, Arkansas and Missouri.

Associated Natural Gas Co.—88 miles, authorized, Missouri.

Carolina Natural Gas Corp.—185 miles, 2-12-in., proposed, lateral lines off Transcontinental in North and South Carolina.

Cities Service Gas Co.—179 miles, 4-30-in., gathering system in vicinity of Ulysses, Kans. Vaughn & Taylor Construct. Co., Inc. D. D. Vaughn, spreadman, Ulysses.

21 miles, 26-in., proposed, Franklin and Anderson counties, Kans.

15 miles, 20-in., Craig County, Oklahoma, to Lawrence County, Missouri.

Coast Counties Gas & Electric Co.—40 miles, 3, 4, and 8-in., planned. Coast and Valley region, California.

Colorado Interstate Gas Co.—250 miles, 20-in., under way, Kit Carson, Colo., to Amarillo, Tex. R. H. Fulton & Co., contractor. Jerry Nash spreadman at Lamar, Colo.

16 miles, 4-in., Pueblo County to Fowler, Colo.

Commonwealth Natural Gas Corp.—537 miles, 20-in., proposed, West Bend, Ky., to Norfolk, Va.

Dow Chemical Co.—70 miles, various sizes, Midland, Saginaw, and Bay City, Mich. Mahoney Contracting Co., contractor. Ralph Bucher, spreadman at Midland.

East Tennessee Natural Gas Co.—172 miles, 22-in., authorized, Greenbrier to Oak Ridge, Tenn.

100 miles, 16-in., proposed, Knoxville to Kingsport, Tenn.

El Paso Natural Gas Co.—133 miles, 30-in., proposed, looping along main line in Texas, New Mexico, Arizona.

36 miles, 24-in., proposed, looping from Kingman to Franconia, Ariz.

Frederick Gas Co.—26 miles, 4-in., planned, Redlands to Frederick, Md.

Georgia Gas Co.—32 miles, 4½-in., proposed, Bogart to Gainesville, Ga.

Glacier Gas Co.—285 miles, 20-in., proposed, Kalispell, Mont., to Spokane, Wash.

120 miles, 16-in., proposed, Spokane to Hanford, Wash.

91 miles, 8¾-in., proposed, Spokane to Lewiston, Idaho.

130 miles, 12¾-in., proposed, Spokane to International boundary at Trail, British Columbia.

Grand Valley Pipe Line Co.—105 miles, 8-10-in., planned, Piceance Creek field to Rifle on to Grand Junction, Colo.

Gulf Interstate Gas Co.—1,000 miles, 30-in., planned, Gulf Coast to North Kentucky.

Home Gas Co.—32 miles, 12-in., authorized, Breesport to Union Center, N. Y.

17 miles, 12-in., proposed, loops from Hancock to Sanford, N. Y.

Hope Natural Gas Co.—33 miles, 8-10-12-in., planned, Wyoming County, West Virginia, south to Buchanan County, Virginia.

Houston Pipe Line Co.—50 miles, 16-in., authorized, Edna to Tom O'Connor. Completion date 9-1-52.

Iowa-Illinois Gas & Electric Co.—41 miles, 10-in., authorized, Washington County to Cedar Rapids, Iowa.

¾ to 6-in., under way, Davenport, Iowa, and Moline, Ill. C. E. Wilson Const. Co.

Kansas-Nebraska Natural Gas Co., Inc.—179 miles, proposed, Kansas and Nebraska.

20 miles, 16-12-in., planned, Hastings to Grand Island, Neb. Completion date 1952.

18 miles, 6-8-in., planned, McCook, Neb., south. Completion date 1952.

54 miles, 4-6-in., planned, Neligh to Hartington, Neb. Completion date 1953.

49 miles, 10-in., planned, Ogallala to North Platte, Neb. Completion date 1952.

20 miles, 12-in., planned, Atwood to near Oakley, Kans. Completion date 1952.

Kansas Power & Light Co.—27 miles, 20-in., authorized. Pratt, Kans., to Calista compressor station.

28 miles, 12-16-in., planned, north of Kansas to Meade County gas field.

Lake Shore Pipe Line Co.—45 miles, 10¾-in., authorized, northwesterly from T.G.T. system near Meadville, Pa., to Ashtabula, Ohio. Harford Bros., contractor.

Lone Star Gas Co.—100 miles, proposed, storage fields to the Dallas-Fort Worth area. 35 miles, 12-in., proposed, southeastern Schleicher County.

Manufacturers Gas Light & Heat Co.—40 miles, proposed, Allegheny, Washington, and Beaver counties, Pennsylvania.

Michigan Gas Storage Co.—93 miles, 16, 22, 24-in., under way, Laingsburg to near Pontiac and Mount Clemens, Mich. (Includes 17 miles of lateral lines.) Mahoney Contractor. Completion date 6-52.

30 miles, 26-in., authorized, looping between Laingsburg and Mount Pleasant Junction, Mich.

Michigan Gas Utilities Co.—77 miles, under way, Sturgis, Hillsdale, and Coldwater, Mich. (22.7 miles, Marshall south to Coldwater; 20 miles, Coldwater easterly to Hillsdale; 22.5 miles, Hillsdale to Sturgis, 11 miles, Hillsdale to Jonesville.) Somerville Const., contractor, Jim Godwin at Coldwater.

MidSouth Gas Co.—240 miles, proposed, Greene, Poinsett, Crittenden, St. Francis, Lee, Phillips, Monroe, Woodruff, and Cross counties, Arkansas.

Minneapolis Light & Power Co.—20 miles, 30-in., under way, Minneapolis, Williams Brothers, contractor. F. W. Caldwell, spreadman.

Mississippi River Fuel Corp.—98 miles, 16- and 18-in., authorized, feeder line from Lincoln Parish, Louisiana, to Waskom field, Harrison County, Texas.

40 miles, 18-in., authorized, Dubach to Perryville, La.

Missouri Central Gas Co.—25 miles, 6-in., contracted, Moberly to Macon, Mo. L. R. Young Const. Co.

Montana Power Co.—52 miles, 16-in., authorized, Canada - Montana border to Cut Bank, Mont.

Morganfield Natural Gas Co.—31 miles, 4-6-in., proposed, through Sturgis, Providence, Clay, Diamond, Wheatcroft, and Sullivan, Ky.

National Utilities Co. of Michigan.—76.7 miles, 20-in., proposed, South Central Michigan. (22 miles from near Marshall south to Coldwater; 20 miles east of Hillsdale; 22 miles southwest to Sturgis; 5 miles from Hillsdale to Jonesville and 8 miles west to Union City.)

Nevada Natural Gas Pipe Line Co.—114 miles, 10-in., proposed, Topock, Ariz., to Las Vegas, Nev.

New River Gas Co.—50 miles, planned, Summers to Monroe counties, West Virginia, to Narrows and Dublin, W. Va.

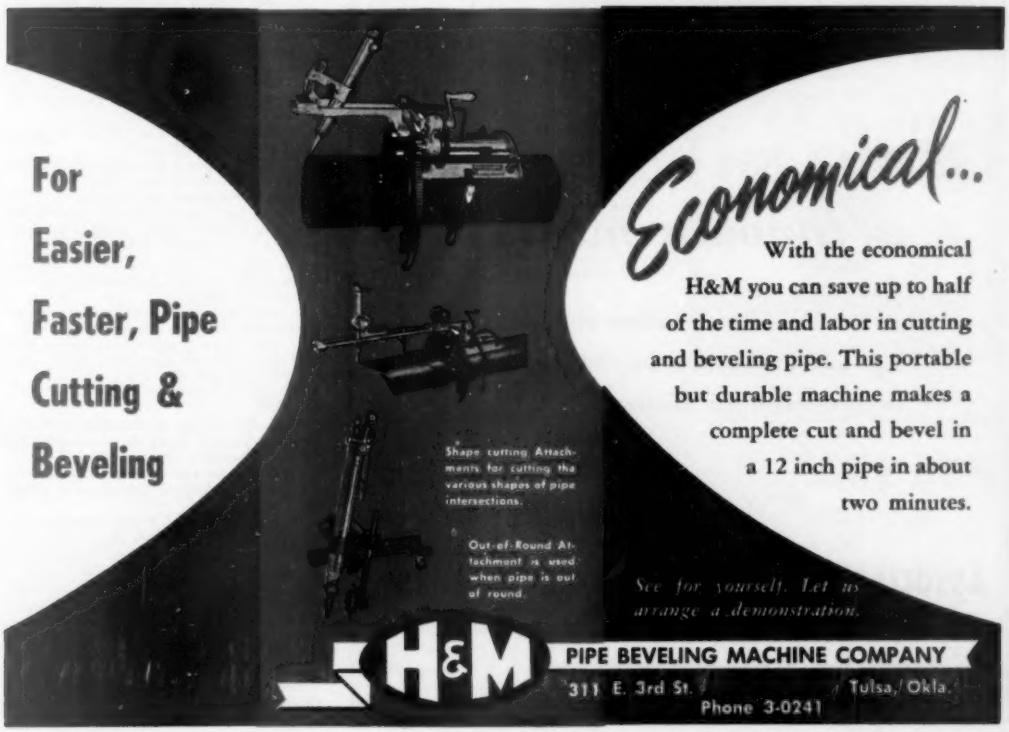
New York State Natural Gas Corp.—104 miles, 14, 16, 20-in., authorized, looping on Westmoreland, Armstrong, and Tioga counties, Pennsylvania. (Includes 17 miles, 16-in., in Potter County, Pennsylvania, and 21 miles 14-in., replacement in Line No. 507, New York.)

12 miles, 20-in., under way, looping at Zelienople, Penn. Williams-Austin Co. Ralph Gaddy, superintendent. 5-15-52.

52 miles, 16-in., contracted, Utica to Amsterdam, N. Y. (to begin at completion of Zelienople). Williams-Austin. Howard Bauer, superintendent. Completion in 90 days.

20 miles, 20-in., begin 5-1, Cayuta Gate to Ithaca, N. Y. Williams-Austin Co. Ed Peters, superintendent. Completion date 6-30-52.

30 miles, 20-in., contracted, Angelica to Rossburg, N. Y. (begin at completion of Cayuta - Ithaca). Williams - Austin. Howard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Bauer, superintendent. Completion in 45 days.

17 miles, 16-in., contracted, Colesburg Junction to Sabinsville, Pa. (begin at completion of Angelica job). Williams-Austin. Howard Bauer, superintendent.

21 miles, Columbiana and Stark counties, Ohio.

Niagara Mohawk Power Corp.—55 miles, 10-in., Fulton to Watertown, N. Y.; Williams-Austin Co., contractor. Howard Bauer, superintendent. Completion date 9-52.

Northeastern Gas Transmission Co.—221 miles, 20-24-in., authorized, New Hampshire, Massachusetts, and Connecticut.

Northeastern Gas Co.—411 miles, proposed, New England towns.

Northern Natural Gas Co.—580 miles, proposed, Kansas, Texas, Oklahoma, and Nebraska loops.

210 miles, 26-in., proposed, five loops in Texas-Oklahoma area, two in Kansas, and two in Nebraska.

400 miles, 24-in., proposed, Emerson, Manitoba south to Red River Valley through Fergus Falls on to St. Paul, Minn.

Northern Indiana Fuel & Light Co.—33 miles, 8-in., proposed, Edgerton to Auburn, Ind.

Northwest Natural Gas Co.—750 miles, planned, Washington, Oregon, and Idaho.

373 miles, 24-in., proposed, Eastport, Idaho, to Monroe, Wash.

79 miles, 18-in., proposed, Monroe to International boundary near Lynden, Wash.

29 miles, 22-in., proposed, Monroe to near Seattle, Wash.

164 miles, 20-in., proposed, Seattle to Portland, Ore.

Ohio Fuel Gas Co.—31 miles, 20-in., authorized, Licking County to Richland County, Ohio.

22 miles, 16-in., authorized, Dayton, Troy, Piqua, and Sidney, Ohio.

23 miles, 16-20-in., authorized, Wellington to Elyria, Ohio; 16 miles, 20-in., authorized, Benton Station to Crawford Station. 18 miles, 20-in., Crawford Station to near Columbus. 16 miles, 16-in., authorized, Berlin to Sandusky, Ohio.

74 miles, 3 to 20-in., authorized, Hocking, Knox, and Ashland counties, Ohio.

47 miles, 20-in., authorized, Benton Township, Hocking County, to Columbus, Ohio.

61 miles, authorized, northern and southwestern Ohio.

33 miles, 20-in., proposed, Jefferson to Seneca, Ohio.

Oklahoma Natural Gas Co.—41 miles, 12-in., authorized, 21 miles Bethany to El Reno, Okla.; 16 miles, Haskell; 14 miles, Henryetta. Completion date 8-30-52.

Pacific Gas & Electric Co.—44 miles, 8-in., under way, Salinas to King City, Calif. W. M. Lyles and company crews. Completion date 6-10-52.

141 miles, 34-in., proposed, parallel sections along Topock-Milpitas line.

10 miles, 10-12-in., authorized, Monterey to Fort Ord to Castroville; 12 miles, 16-in., Napa Wye to Shellville; 6 miles, 12-in., Cotati to Santa Rosa, Calif.

Panhandle Eastern Pipe Line Co.—70 miles, 24-26-in., under way, looping from Sneed, Tex., to Emporia, Kans.

174 miles, 30 and 26-in., contracted. Tuscola, Ill., eastward—looping present system; R. A. Conyes, contractor.

44 miles, 26-in., Edgerton, Mich., Anderson Brothers.

22 miles, 30-in., looping in Tuscola, Ill.

45 miles, 30-in., looping in Montezuma, Ind.

63 miles, 30-in., looping in Zionsville, Ind.

Pennsylvanian Gas Co.—52 miles, 12-in., between Warren and Erie, Pa. Section 1—27 miles, under way and contracted by Harford Brothers. Section 2—25 miles.

Peoples Natural Gas Co.—25 miles, proposed, Cambria and Blair counties, Pennsylvania.

Permian Basin Pipeline Co.—384 miles, 20-30-in., proposed, Permian basin area to eastern New Mexico.

139 miles, planned, Upton County, Texas, to Lea County, New Mexico.

76 miles, planned, Lea County to Roosevelt County, New Mexico.

169 miles, planned, Roosevelt County, New Mexico, to Carson County, Texas.

Phillips Petroleum Co.—250 miles, 30-in., underway, gas gathering system, Midland and Glasscock counties, Texas, Vaughan & Taylor Const. Co. Completion date 10-52.

200 miles, 2 to 30-in., authorized, Midland, Upton, Glasscock, and Regan counties, Texas. Completion date 5-53.

65 miles, 4 to 30-in., authorized, Goldsmith field system, Texas. Completion date 1-53.

28 miles, 10-in., authorized, Bayou Plant to Adams Terminal. Completion date 7-53.

Prince George's Gas Corp.—20 miles, 22-in., authorized, between Chillum and Rockville, Md.

Public Service Co. of Colorado.—95 miles, proposed, Douglas Creek and other gas fields to Grand Junction, Colo., area.

Public Service Co. of North Carolina.—33 miles, 10-in., authorized, Burlington to Chapel Hill, N. C.

16 miles, 8-in., authorized, Chapel Hill to Raleigh, N. C., completion date 7-1-52.

29 miles, 4-in., authorized, Statesville to Kanapolis, N. C. Completion date 7-1-52.

83 miles, 8-in., authorized, Kings Mountain

Rockland Light & Power Co.—22 miles, 8-in., proposed, Orangetown to Tompkins, Cove, N. Y.

South Georgia Natural Gas Co.—339 miles, 2-12-in., proposed, Florida and Georgia.

Southern California Gas Co.—35 miles, planned, Antelope Valley, California.

Southern California Gas Co. and Southern

J. W. SHARMAN

Announcement . . .

● Mr. Earl Allen, President of Associated Pipe Line Contractors, Inc., takes pleasure in announcing the election of

J. W. SHARMAN

Vice-President

ASSOCIATED PIPE LINE CONTRACTORS, INC.

Earl Allen, President — J. W. Sharman, Vice-President

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Counties Gas Co. of California.—45 miles, 30-in., proposed, looping on line from Arizona border to Los Angeles.

81 miles, 30-in., proposed, Whitewater to Desert Center, Calif.

Southern Natural Gas Co.—1,255 miles, 24 to 4½-in., proposed, Louisiana, Mississippi, Alabama, and Georgia.

21 miles, 24-in., authorized, Perryville Station, La., to Boeuf River.

14 miles, 24-in., authorized, Onward Station, Miss., to Big Sunflower River.

14 miles, 14-in., authorized, Perryville Station, La., to Wilhite Gate.

375 miles, 24-in., planned, Gwinville, Miss., to Atlanta, Ga.

169 miles, proposed loops, Ouachita Parish, Louisiana, to Augusta, Ga.; 20 miles in Ouachita Parish, 33 miles in Ouachita and West Carroll parishes; 7 miles, Sharkey County, Mississippi; and 108 miles, 14-in., Bass Junction to Augusta, Ga.

Southern Union Gas Co.—21 miles, 20-in., authorized, Albuquerque, N. M.

27 miles, 10-in., authorized, Lea and Eddy counties, New Mexico.

30 miles, 12-20-in., contracted, San Juan County, New Mexico. R. H. Fulton & Co.

Southwest Gas Corp., Ltd.—26 miles, proposed, from P.G.&E. line to Victorville, Calif.

Tennessee Gas Transmission Co.—591 miles, 24-30-in., proposed, looping along present system (consisting of 323 miles of 30-in.; 167 miles of 26-in.; 101 miles of 24-in.)

420 miles, 30-in., Texas, Louisiana, Arkansas, Mississippi, Tennessee, and Kentucky.

101 miles, 26-in., Kentucky and Ohio.

304 miles, 24-in., proposed, Mercer, Pa., to Utica, N. Y.

250 miles, miscellaneous laterals.

116 miles, 30-in., three loops, Refugio to Cleveland, Tex.; Oklahoma Pipe Line Constructors. Ed Flanagan, Victoria, Tex.

80 miles, 26-in., contracted, Harrison County to Jackson County, Ohio. H. C. Price Co., contractor.

24 miles, 26-in., contracted, Carrollton, Ohio, southwestward to Harrison County, Ohio. H. C. Price Co., contractor.

56 miles, 26-in., contracted, Athens, Ohio, to Jackson County, Ohio. H. C. Price Co., contractor.

126 miles, 30-in., under way, Arkansas, Louisiana, and East Texas. Houston Contracting Co.

(Spread 1) 43 miles, 30-in., under way, Gallion, La. Houston Contracting. W. H. Hayes, superintendent, M. L. Thompson, assistant superintendent.

(Spread 2) 45 miles, 30-in., under way, Eros, La., to Coldwater, La. Houston Contracting. F. A. Silar, superintendent.

(Spread 3) 39 miles, 30-in., Sabine River south to Jasper Compressor Station. Houston Contracting. E. C. Norris, superintendent, R. E. Thornton, assistant superintendent.

Texas Eastern Transmission Corp.—791 miles, 30-in., under way, Kosciusko, Miss., to Connellsville, Pa.

Section 8, 77 miles, 30-in., under way, Portsmouth to Amesville, Ohio. Anderson Brothers Corp.

Section 9, 74 miles, 30-in., under way, Amesville to Ohio-West Virginia river crossing. Anderson Brothers Corp.

Section 10, 66 miles, 30-in., under way, Ohio River to Connellsville, Pa. Anderson Brothers Corp.

30-in., Wheeling, W. Va. Brown & Root.

80 miles, 30-in., underway, Columbia, Ky., to Kentucky River, N. A. Saigh Co., Inc., Carl Doyle, Danville, Ky.

315 miles, 24-in., proposed, Provident City, Tex., to Castor, La.

Texas Gas Transmission Corp.—408 miles, 26-in., proposed, looping from Bastrop to Hardinsburg, Ky.

223 miles, 26-in., proposed, Bastrop, La., to Covington, Tenn.

47 miles, 26-in., proposed, northeastward from Covington.

49 miles, 26-in., proposed, northeastward from Kenton, Tenn.

45 miles, 26-in., proposed, northeastward from Calvert City, Ky.

25 miles, 26-in., proposed, northeastward from Slaughters, Ky.

19 miles, 26-in., proposed, southwestward from Jeffersontown, Ky.

180 miles, 26-in., authorized, Acadia Parish to connection with existing facilities in Morehouse Parish.

35 miles, 12-in., authorized, Slaughters, Ky., to Evansville, Ind.

195 miles, 26-in., proposed, Gulf Coast region to southwestern Louisiana.

560 miles, 26-in., proposed, Louisiana and Kentucky.

Undetermined mileage, 30-in., Moundsville, W. Va. H. C. Price, contractor.

Undetermined mileage, 30-in., Woodsfield, Ohio. H. C. Price, contractor.

361 miles, 26-in., under way, Mississippi River near Greenville, Mississippi to Jeffersontown Station, Ky. H. C. Price Co. Completion date 11-15-52.

46 miles, 26-in., under way, Bastrop, La., to north of Mississippi River. W. H. Hayes, superintendent. Houston Contracting.

Texas-Ohio Gas Co.—1,350 miles, 30-in., proposed, Hidalgo County, Texas, through Arkansas, Mississippi, Tennessee, and Kentucky on to Spencer, W. Va. Completion date 6-30-53.

Union Oil Co. of California.—40 miles, 8-10-in., planned, San Joaquin Valley and Los Angeles basin.

United Fuel Gas Co.—32 miles, 20-in., under way, Lanham to Broad Run, W. Va. H. L. Gentry Construction Co., contractor. Frank Morris, spreadman at Charleston, W. Va.

United Gas Pipe Line Corp.—70 miles, 30-in., underway, Houston to So. Bank of Trinity River, Tex., Louis Visentine, Conroe, Tex.

510 miles, 20 to 30-in., under way, Agua Dulce, Tex., to Monroe, La. River Const. Corp., contractor.

Spread 1, 51 miles, 30-in., from Pearl River north and south of Jackson, Miss. Red Tatom, superintendent at Jackson.

Spread 2, 45 miles, 30-in., McComb to Pearl River south of Jackson. Merle Tatom, superintendent at Hazelhurst.

Spread 3, 30 miles, 30-in., Kosciusko south toward Jackson. Jimmy Reed, superintendent at Kosciusko.

Spread 4, 29 miles, 12-in., Lafayette to Jeanerette, La. Roy Earnhart, spreadman at Jeanerette.

124 miles, Sterlington compressor station, near Monroe to Jackson, Miss.

23 miles, 8-12-16-in., South Louisiana facilities.

53 miles, 24-in., authorized, Texas.

36 miles, proposed, offshore from Ingleside to near Refugio, Tex.

All contracted by River Const. Corp., a joint venture including Oklahoma Contracting Co.; J. Ray McDermott & Co., Inc., and Morrison-Knudson. Inspection by Brown & Root, Inc.

Virginia Natural Gas Co.—153 miles, Buckingham to Richmond and Portsmouth, Va.

Western Kentucky Gas Co.—2 to 4-in., under way, additions to present system; Modern Welding Co., Inc., contractor.

Western Pipe Lines.—1,200 miles, 22-In. planned, southern Alberta to Duluth, Minn.

Wilcox Trend Pipe Line Co. (Harry Bass Drlg. Co.)—150 miles, various up to 20-in., planned, gathering system for delivery to

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PIPE LINE MAPS

Map No. 25. "Jacobson's Map Showing Crude Oil and Gasoline Pipe Lines of the United States."

SHOWS: Crude oil pipe lines in blue—gasoline pipe lines in red—key refineries with capacity barrels crude oil per day—principal cities and towns.

Size 54" x 76". Scale 1" = 40 miles.
Prices: Paper, $38.00; Linen, $47.50.

•

Map No. 26. "Jacobson's Map Showing Natural Gas Pipe Lines of the United States."

SHOWS: Natural gas pipe lines with pipe sizes—major gas fields in solid red—general gas areas outlined in red—cities and towns.

Size 54" x 76". Scale 1" = 40 miles.
Prices: Paper, $38.00; Linen, $47.50.

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proposed Texas Eastern terminal at Provident City, Tex.

Foreign Crude - Oil Pipe Lines—Planned and Under Way

Alberta - Vancouver Oil Pipe Line Co.—(Brokaw, Dixon, McKee).—972 miles, 16-in., proposed, Edmonton via Pincher Creek Alta., Idaho and Washington states to Vancouver, B. C.

Cia. de Petroleo Ganso Azul, Ltd.—48 miles, 4-in., planned, Ganzo Azul field to Pucalpa on upper Ucayali River, Peru.

Condor.—90 miles, 12-in., under way, Genoa to Rho, near Milan, Italy. Soc. Ital. Condotte Acqua Montubi, contractor. Completion date 9-52.

Creole Petroleum Corp.—143 miles, 26-in., under way, Ule (State of Zulia) to Amuay (State of Falcon). Williams Bros. de Venezuela, S.A., contractor of overland sections. Charles Williams, manager; Marvin Jones, general superintendent, Maracaibo. McWilliams, Gahagan, and Anderson Brothers, contractors of water crossings. Completion date March 1953.

25 miles, 34-in., authorized, Lagunillas to La Salina (State of Zulia). Completion date April 1953.

Direccion General de Yacimientos Petroliferos Fiscales.—409 miles, under way, Plaza Huincul to Bahia Blanca, Argentina.

Interprovincial Pipe Line Co.—100 miles, 16-in., contracted, Regina, Sask., to Gretna, Man., Canada. Anderson International Contractors, Ltd.

32 miles, 16-in., Kendal to Peebles, Sask., Canada.

67 miles, 16-in., Carroll to Somerset, Man., Canada.

Iraq Government.—135 miles, 12-in., proposed, from Iraq Petroleum Co. at Baija to Baghdad, Iraq. Construction 1952. M. W. Kellogg, contractor.

72 miles, 12-in., Zubair to Fao, Iraq. Arabian Bechtel Co., contractor.

Mene Grande Oil Co.—32 miles, 26-in., authorized, Anaco to Puerto La Cruz.

Middle East Pipelines, Ltd.—800 miles, 34-35-in., planned, Iran to a Levantine port.

Petroleos Mexicanos.—145 miles, 12-in., considered, 18 de Marzo field via Reynosa to Monterrey, Mexico.

100 miles, planned, Isthmus of Tehuantepec, Jose Colomo to El Plan field, Minatitlan.

Socony-Vacuum Oil Co., Inc.—20 miles, 8-10-in., under way, Hutchinson, Kans. Brown-Lite Contractor.

Spitz & O'Berine.—264 miles, 24-in., under way, Capetown to Tarrytown, South Africa. J. C. Spitzexplari, spreadman at Capetown.

Texas Petroleum Co.—60 miles, 4-6-in., under way, Pto, Nino to La Dorada.

Trans-Mountain Oil Pipe Line Co.—639 miles, 24-in., under way, Edmonton, Alta., to Vancouver, B. C. Canadian Bechtel, Ltd., engineers.

472 miles, 24-in., under way, western section of line to Comstock Midwestern, Ltd. 221 miles, 24-in., under way, center section to Mannix, Ltd.

(Spread 1) 238 miles, Acheson to Lake Yellowhead.

(Spread 2) 109 miles, Lake Yellowhead to Blue River.

(Spread 3) 120 miles, Coquihalla Canyon to Burnaby.

Foreign Products Pipe Lines—Planned and Under Way

Colombia Ministry of Petroleum.—90 miles, 6-in., planned, Puerto Berrio to La Dorada, Colombia.

113 miles, 6-in., contracted, Puerto Berrio to Acededo near Medellin, Colombia, Carolina Construction Co.

75 miles, 4-in., planned, Buena Ventura to Cali, Colombia.

Empresa de Ferrocarriles Ecuatorianos.—50 miles, 6-in., contracted, Guayaquil to Palmira, Ecuador. J. A. Jones, contractor; C.R.C. Engineering Co., engineers.

Estrada de Ferro Santos a Jundiai.—32 miles, 18-in., under way, Santos to Sao Paulo, Brazil (fuel oil line); Techint, contractor. Completion date 7-52.

Governments of Southern Rhodesia and Portuguese East Africa.—200 miles, considered, Beria, Portuguese Mozambique to Umtali, Southern Rhodesia.

Imperial Oil Co., Ltd.—170 miles, 10-12-in., under way, Hamilton to Toronto, Ont., Canada, Comstock - Midwestern, Ltd., contractor. Completion date July 1952.

Petrocongo (Sub. Cie. Financiere Belge des Petroles, S.A.).—225 miles, considered, Ango-Ango to Leopoldville, Belgian Congo.

Societe des Transports Petroliers par Pipe Line.—160 miles, 10-in., under way, Le Havre to Paris, France. Entrepose, contractor. Completion date 1953.

State of Cundinamarca, Colombia.—120 miles, 6-in., Puerto Salgar to Bogota, Colombia; Williams Brothers Co.; David Louthen, manager, Bogota.

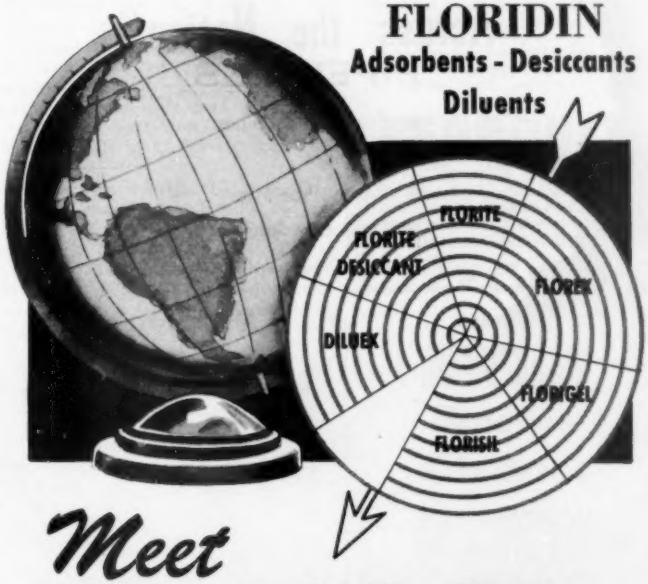
Trans-Northern Pipe Line Co.—440 miles, under way, Hamilton, Ont., to Toronto, Ont., to Montreal, Que., Canada. Contracted by Mannix-Williams Bros., Ltd.

Foreign Natural - Gas Pipe Lines—Planned and Under Way

Azienda Generale Italiana Petroli.—110 miles, 12-14-16-in., planned, Cortemaggiore to Genoa.

145 miles, 14-16-in., under way, Cortemaggorie to Torino. Completion date 1951.

Canadian Delhi Oil Co. (Subsidiary Delhi Oil Co.).—2,132 miles, proposed, Alberta, Toronto, Montreal.



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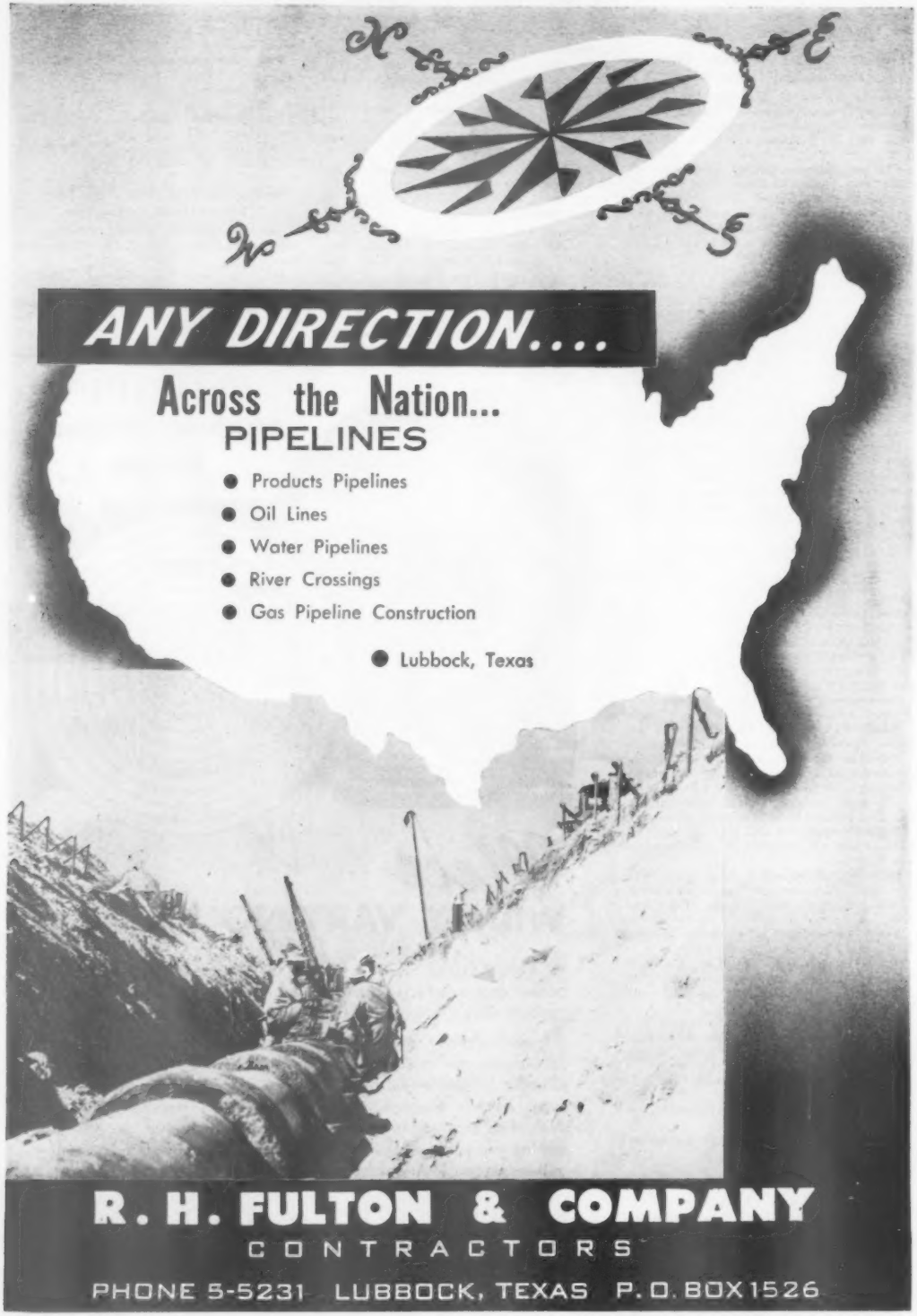
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PIPE LINES

Big Project O.K.'d

Tennessee gets go-ahead on $128,216,000 job

WASHINGTON. — Tennessee Gas Transmission Co., Houston, has received the green light from the Federal Power Commission to proceed with $128,216,000 construction program, which will increase delivery capacity of its natural-gas-transmission system by 205,000,000 cu. ft. daily.

Tennessee's expansion program involves construction of about 591 miles of parallel loop lines along its existing system; about 304 miles of 24-in. line from Mercer, Pa., to a point near Utica, N. Y.; about 137,000 hp. in compressor units at existing or authorized compressor stations; 28,000 hp. in compressors at new stations; and about 250 miles of miscellaneous lateral lines.

The project is similar to one for which Tennessee refused to accept an FPC certificate last summer. The commission then authorized Tennessee to build facilities to increase its system capacity from 1,310,000,000 cu. ft. to about 1,395,000,000 cu. ft.

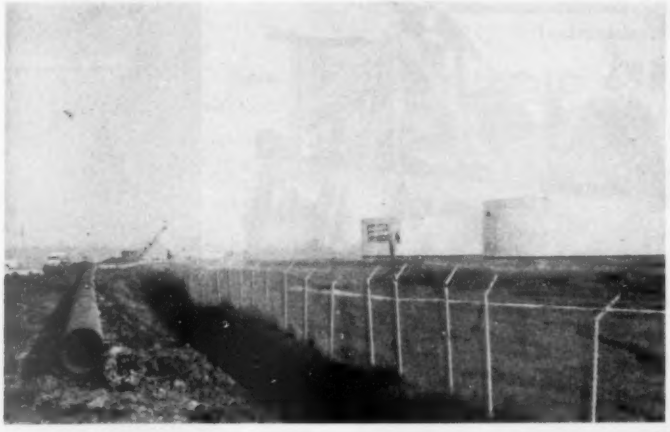
The company refused to accept the certificate, because authority to build a line from Hebron storage field in Potter County, Pa., to Utica, N. Y., was denied.

Tennessee appealed the commission's June 1 order, and the Hebron-Utica line again was turned down early in September *(The Oil and Gas Journal, September 6, 1951, page 125)*. The company filed a petition in January to reopen the proceedings for presentation of new evidence.

Hebron project o.k.'d . . . Joint development of an underground storage project in Hebron field by Tennessee and United Natural Gas Co., Oil City, Pa., also was approved by FPC.

The $7,400,000 project will provide Tennessee with an additional 200,000,000 cu. of gas on peak days. This, together with the new pipe-line capacity, will raise the company's system capacity on peak days from 1,310,000,000 cu. ft. to 1,715,000,000 cu. ft. daily.

Of the new capacity, FPC has approved allocation of: 15,000,000 cu. ft. to United Natural Gas Co.; 15,000,000 cu. ft. to Equitable Gas Co., Pittsburgh; 15,000,000 cu. ft. to Iroquois Gas Corp., Buffalo; 64,000,000 cu. ft. to Northeastern Gas Transmission Co., Springfield, Mass.; 19,030,000 cu. ft. to East Tennessee Natural Gas Co., Chattanooga; 14,000,000 cu. ft. to Tennessee Natural Gas Lines, Inc.,



Rancho Operation Progressing

Pipe now is being welded in sections on right-of-way adjacent to Sinclair's refinery tank farm in the Ship Channel area of Houston. The big 455-mile, 24-in. crude pipe line from McCamey in Upton County, West Texas, to Houston is scheduled to be in operation before November 30. Initial capacity will be 210,000 bbl. daily. Other participants in the Rancho Pipe Line System in addition to Shell Pipe Line Corp., which is supervising construction and will operate the line, are Ashland Pipe Line Co., Sinclair Pipe Line Co., Pan American Pipe Line Co., Tidewater Pipe Line Co., Nantucket Pipe Line Co., and Phillips Pipe Line Co.

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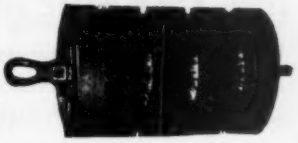

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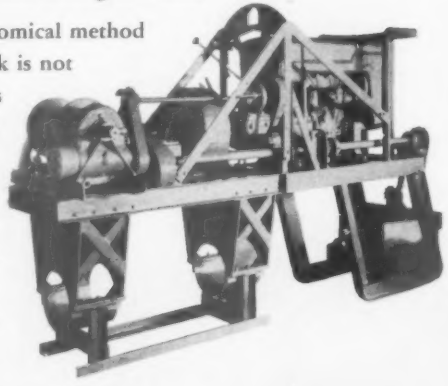

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Nashville; 3,000,000 cu. ft. to Western Kentucky Gas Co., Owensboro; and 3,970,000 cu. ft. for small towns and communities.

Texas-Ohio Hearing Before FPC to Reconvene July 7

WASHINGTON.—The Federal Power Commission hearing on Texas-Ohio Gas Co.'s application to build a 1,435-mile, 30-in. natural-gas line from the Rio Grande River on the United States-Mexican border in Hidalgo County, Texas, to near Spencer, W. Va., will reconvene here July 7.

The commission said it would defer ruling on a motion by an FPC counsel to dismiss the application until Texas-Ohio has introduced all supporting evidence it is prepared to submit.

Two other related applications filed by the company were consolidated by the commission. They were for authority to import 200,000,000 cu. ft. of natural gas from Petroleos Mexicanos in Mexico and for a Presidential permit for construction, maintenance, and operation of the facilities needed to carry the imported gas.

Texas-Ohio's arguments will be followed by cross-examination by other interested parties, including the FPC staff counsel, and the hearing will then be recessed pending further order by the commission.

The staff counsel contends that the company has failed to show that it has a market for the gas it would carry in the proposed line.

United Expects to Complete 1,000-Mile Grid This Year

SHREVEPORT.—United Gas Pipe Line Co. is making rapid progress on one of the biggest pipe-line expansion programs ever launched and expects to complete the project late this year.

N. C. McGowen, president of United Gas Corp., told stockholders at the annual meeting here, that construction should be completed as planned unless unforeseen consequences arise from the steel strike.

The company's expansion involves primarily the laying of about 1,000 miles of large-diameter lines as a gird over the present system in Texas, Louisiana, Mississippi, and parts of Alabama and Florida.

Pipe-line construction, not including suspension river crossings, is being handled by Gulf-Southern Contractors. The contract is reported to be the largest single pipe-laying contract in the United States.

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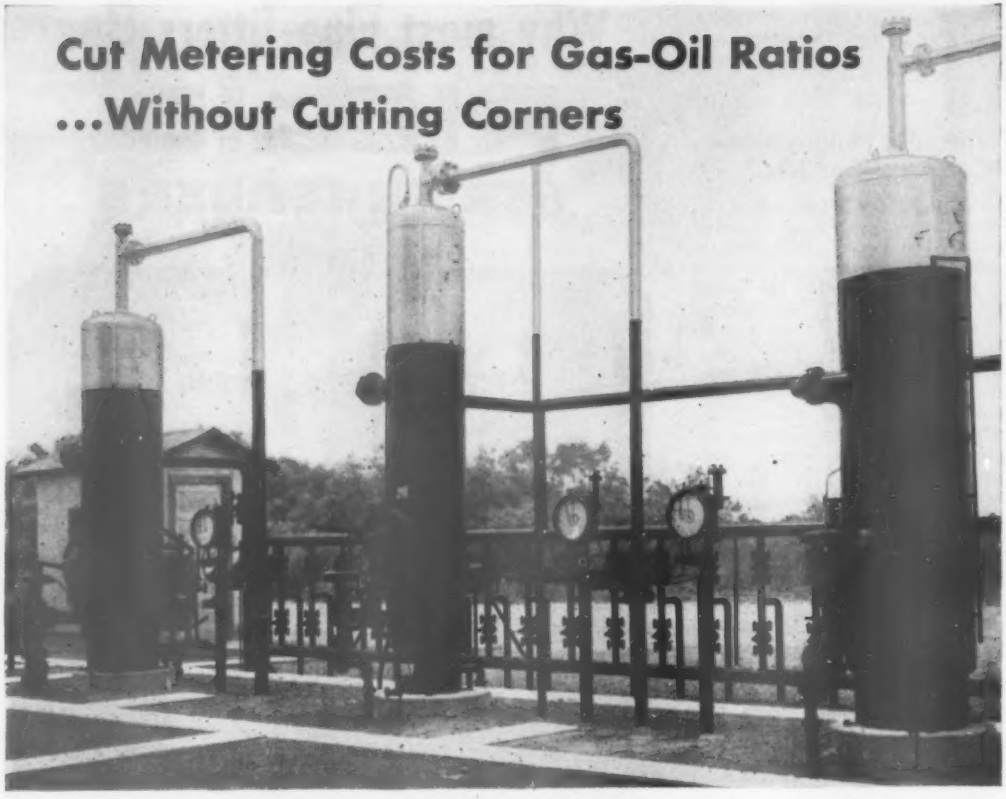

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NATURAL GAS

Tennessee Replaces Transco As Northeastern Supplier

WASHINGTON.—The Federal Power Commission has revoked its order issued last November authorizing Transcontinental Gas Pipe Line Corp., Houston, to deliver 64,000,000 cu. ft. of natural gas per day to Northeastern Gas Transmission Co., Springfield, Mass.

Transcontinental filed a petition with the commission in February seeking modification of the November order to rescind authority for sale and delivery of the gas to Northeastern. This was consolidated for hearing with other proceedings including Transco's plan for permanent disposition of the gas to other customers.

The company said that it was unable to raise the required funds to build the New England lateral in the proposed way due to higher-than-estimated costs. Transco also said that it did not have the necessary pipe and that it was faced with litigation on the condemnation of a compressor-station site in New York.

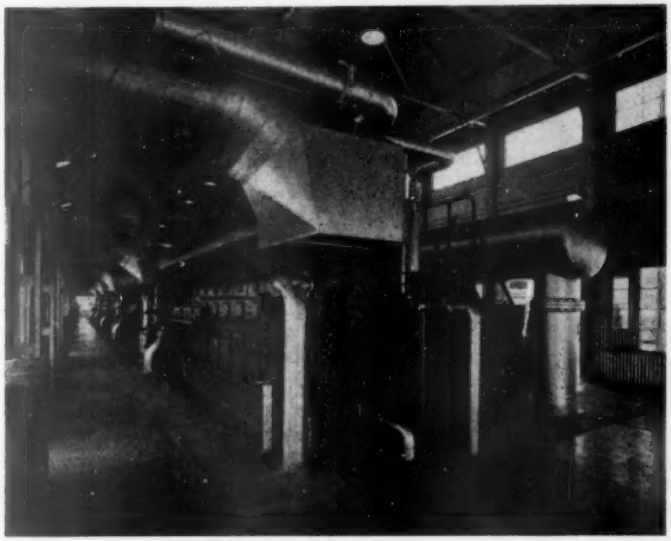
The commission concurrently issued an order permitting delivery of the 64,000,000 cu. ft. to Northeastern by Tennessee Gas Transmission Co. instead of Transco (See pipe-line department in this issue).

New Group Protests Ceiling On Gas From Woodlawn Field

WASHINGTON.—Already harassed by several protests filed against its order setting a ceiling price of 10 cents per thousand cubic feet for natural gas from Woodlawn field of Harrison County, Texas, the Office of Price Stabilization is faced with still another.

The latest formal protest was filed jointly by Hollandsworth Oil Co., Longview, Tex.; D. C. Bintliff, Houston; A. Y. Lewis, Tyler, Tex.; and U-Tex Oil Co. and John Wallace, both of Salt Lake City.

The group is seeking a ceiling of 12 cents per M.c.f.



New Trend in Compressors

The possibility that natural-gas pipe lines are in the initial stages of a trend toward use of larger engines to drive compressors is indicated by recent installations of 2,500-hp. units by El Paso Natural Gas Co. along its big line in the Southwest and by Warren Petroleum Corp. and Oklahoma Natural Gas Co. at the new Ringwood natural-gasoline plant (shown here) near Enid, Okla. In the past, companies have been reluctant to install engines larger than 800 to 1,600 hp. due to the much larger loss in deliverability if a big engine should break down. This argument is still valid, but those who favor the big fellows counter that engine breakdowns now occur so infrequently that the consideration is no longer important. The Ringwood plant has five 2,500-hp. Clarks. It was opened formally June 6 (The Oil and Gas Journal, June 9, 1952, page 53).

Natural Gasoline

Phillips Completes Plans For New Pembrook Plant

BARTLESVILLE.—Phillips Petroleum Co. has completed plans for its new Pembrook natural-gasoline plant about 42 miles south and east of Midland in the Spraberry trend area of West Texas.

The plant will be located about 20 miles south of Phillips' Spraberry plant, which is now under construction. Size and design of the Pembrook plant will be approximately the same as at Spraberry plant.

Spraberry plant, originally designed to process 60,000,000 cu. ft. of gas daily from wells in the trend, now is being expanded to handle more than 150,000,000 cu. ft. daily. Other plant facilities will be increased as the drilling of new wells warrants, the company said.

Another move to be made soon will be the extension of Phillips products-gathering line from Spraberry plant to the Benedum processing plant, about 34 miles to the north. Phillips bought an undivided half interest in this plant from Plymouth Oil Co. in November of last year. The company contracted to purchase the liquid-gas products from the plant, which has a processing capacity of 100,000,000 cu. ft. of gas per day, according to W. S. Hallanan, Plymouth president.

Phillips officials said this plant will be equipped to handle 30,000,000 cu. ft. of additional gas from wells in Benedum field and the surrounding Spraberry area.

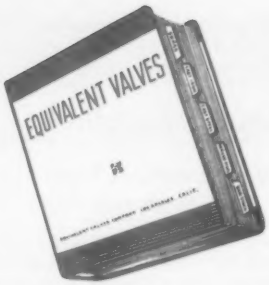
All facilities are scheduled to be completed and in operation by the early part of next year.

Oklahoma Plant Planned

TULSA.—A new firm, incorporated here last week with a capitalization of $100,000, has revealed that it will build and operate a natural-gasoline plant near Coyle, Okla.

Officials of the company, Central Petroleum Co. of Tulsa, said work on the plant is scheduled to start immediately.

Incorporators are listed as Carl E. Baird and K. W. Anderson, both natural-gasoline plant contractors, and Joseph A. Moran, attorney.



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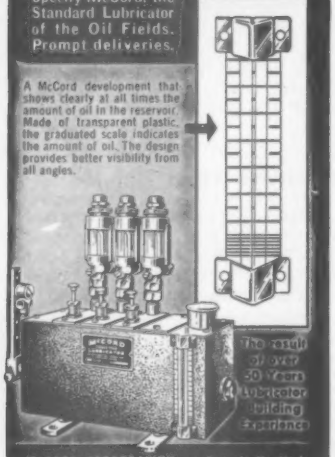

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REFINING

Diesels Superior

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BUFFALO.—Diesel-driven generators are superior in the long run to stem turbines for the average-size electric-power plant in the Midwest, the Oil and Gas Power Division of the American Society of Mechanical Engineers was told last week.

Using data from his own and neighboring installations, G. V. Yarger, superintendent of Municipal Utilities, Waverly, Iowa, cited operating and fixed costs which favor the diesel type of installation.

Turbo-charged, heavy-duty diesel engines producing 1 kw.-hr. per 10,350 B.t.u. of 10-cents-a-gallon South Texas crude equivalent to No. 4 fuel, will cost 9.738 mils per kilowatt hour for operating expenses. In a steam plant of the latest design with 450-psi. turbine, boiler operating at a temperature of 750° F. and producing 1 kw.-hr. from 14,500 B.t.u. of $9-a-ton Illinois coal, operating costs are slightly less—9.517 mils per kilowatt hour.

Fixed costs . . . On fixed costs, however, the diesel installation proved much more economic, with depreciation and insurance estimates running only 3.415 mils per kilowatt hour as compared with 6.832 mils for steam. This results in over-all costs of diesel power plants running an estimated 80 per cent of those of coal-fired steam plants for 5,000-kw. installations in that locality.

The constant increase in ratings and speeds of heavy-duty commercial engines has resulted in greater lubricating problems, according to W. J. Blessing, Worthington Corp., Buffalo. Discussing lubrication problems, he said that lubricating-oil recommendations now are devoting more emphasis to viscosity, resistance to heat, low carbon formation, and nonsludging characteristics.

Union to Place Wilmington Cracker in Operation Soon

WILMINGTON, Calif. — Union Oil Co. of California expects to place the new fluid catalytic cracking unit at its refinery here on stream soon.

The 28,500-bbl. cracker now is being tied in with an existing Thermofor catalytic cracking unit which was shut down last month.

Revision of the Unisol gasoline-treating plant already has been completed. The plant is used for treating light pressure distillates produced from both the catalytic and thermal cracking operation. It will remove hydrogen sulfide and mercaptans using methyl alcohol and caustic soda. The plant has a treating capacity of more than 20,000 bbl. daily of light pressure distillates.

Also completed are a new steam condensate recovery unit and an enlarged boilerwater treating plant.

The expansion program involves, in addition, the construction of 40,000 bbl. of capacity in crude units.

University of Oklahoma Launches Grease Study

NORMAN, Okla. — The University of Oklahoma, with industry cooperation, has launched a study of methods of improving lubricating greases at its engineering laboratories, according to Prof. Walter J. Ewbank, School of Mechanical Engineering.

The program will deal with all phases of the milling of greases in order to learn as much as possible what changes take place under such action. First project under study is the production of lithium hydroxy stearate greases.

New machinery developed by Morehouse Industries, Los Angeles, has been supplied to the fuels and lubricants laboratory of the university for use during the study.

Also cooperating in the project are Cato Oil & Grease Co., Oklahoma City; Archer-Daniels-Midland Co., Cleveland; and Foote Mineral Co., Philadelphia.

The sponsors, Morehouse Industries, and the cooperating firms are all members of the National Lubricating Grease Institute.

Carbide & Carbon Contracts Seadrift Petrochem Plant

HOUSTON. — Carbide & Carbon Chemicals Co., division of Union Carbide and Carbon Corp., has designated Brown & Root, Inc., Houston, as designer and builder of its new petrochemical plant on the Texas Gulf Coast, according to George R. Brown, executive vice president of Brown & Root.

The plant has been unofficially estimated to cost around $43,000,000.

In the rumor stage since last winter, the project was disclosed officially recently by Dr. J. C. Davidson, president

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Fluor's modern building pictured above was completed in mid-1952. A second building is to be completed in late 1952. Both buildings are air-conditioned and are designed on a compartmental basis to provide engineering offices, drafting rooms, blueprint rooms, supply and storage areas, and offices for accounting, purchasing and administrative personnel. Each building contains 15,000 square feet of floor space— a total of 30,000 square feet devoted exclusively to the work of Fluor's Mid-Continent Engineering Division.

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of Carbide & Carbon Chemicals. Construction of the new plant has been approved and a certificate of necessity awarded by the Defense Production Administration.

The big petrochem installation will be located about 8 miles northwest of Seadrift in Calhoun County. This is about equidistant between Houston and Corpus Christi.

Field work will begin early this fall, Brown said. John C. Sillin and Frank C. Kuick, both of Brown & Root, will be project engineer and project manager, respectively.

The new plant will be the company's second largest on the Gulf Coast, second only to its chemical plant at Texas City. It will produce a variety of synthetic organic chemicals and plastic resins, with emphasis on ethylene oxide. End product will be polyethylene resins made by polymerizing ethylene at high pressure.

Refining Briefs

Humble Oil & Refining Co. has announced that suggestions from its employes during the first quarter of this year under a "coin your ideas" program will save the firm more than $128,000 annually. Employes submitting acceptable ideas received awards totaling more than $8,000.

American Cyanamid Co. has developed a new additive for lubricating oil which Howard E. Hehns, manager of the firm's petroleum-chemicals department, says will permit efficient use of fuels with high sulfur content under the severest operating conditions. The new product, "Aerolube 92," combines antioxidant and bearing-corrosion inhibition properties with "highly effective alkaline detergency."

Socony-Vacuum Oil Co., Inc., is marketing a new motor oil which it claims reduces engine wear and oil consumption through the use of a "super-detergent formula that helps engine working parts to remain freer of deposits than ever before." The new product is said to lengthen engine life by reducing engine corrosive wear drastically during starts, warmups, and stop-go driving, when most wear occurs.

There is no evidence of an impending octane race, according to C. E. Davis, assistant deputy administrator for the Petroleum Administration for Defense. Such a drive had been forecast if restrictions on the use of tetraethyl lead in gasoline were lifted.

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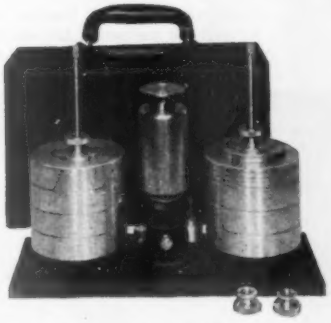

For complete specifications write for Bulletin 50.

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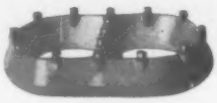

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Among the Drilling Contractors

Pike Drills 750th Well In California Operation

Thomas P. Pike Drilling Co., Los Angeles, has chalked up its 750th well with the drilling of Shell Oil Co. 8 Menchego, located in the Brea-Olinda field.

This well is one of a series which Pike has drilled for Shell in development of deeper productive horizons in that field during the last several years. Like most of the others, it has been a directionally controlled well, drilled from a remote surface location. It has been drilled with the company's No. 12 rig, a National 50, purchased last August, and has been the sixth hole for the rig. V. L. Parker has been the pusher.

The company, organized in 1938, currently is operating 17 rigs, all of which are now in California.

Hills & Hills will be the contractors on the first of a series of four wildcat tests which General Atlas Co. has projected for McIntosh County, North Dakota, and the adjoining McPherson County, South Dakota. The first test, scheduled to go to the granite, is 1 Keterrling, located in the C NE NE 15-131-73w, on the North Dakota side of the line. The operator is an affiliate of Cabot Carbon Co., Pampa, Tex.

New Drilling Company

Evansville Drilling Co. is a newly formed contracting firm operating in the tri-state area of Illinois, Indiana, and western Kentucky. J. C. Westfall, Sr., is owner, with offices at Evansville, Ind. The firm has acquired a new National T-12 rotary rig.

Byars Drilling Co., Tyler, Tex., is drilling a 5,600-ft. wildcat for C. Andrade and associates as the 1 Otis Nerren, 2½ miles north of Manning in Angelina County, East Texas. Surface casing had been set at this report.

Peters Drilling Co., Longview, Tex., has drilling under way for Tom Potter and others at 1 G. H. Sanders, 7,000-ft. wildcat, 11 miles southeast of Marshall, in Harrison County, East Texas.

J. D. Ferrell Drilling Co., Great Bend, Kans., has moved a rig to a wildcat location 2 miles northwest of Goodland, in Sherman County, in the extreme western part of Kansas, where it is starting a contracted test for Kingwood Oil Co. and Aurora Gasoline Co.

TIME OUT . . . On the floor of a heavy-duty rotary rig Steen Drilling Co., Houston, is operating near Garwood, Colorado County, Texas Gulf Coast. Top, left: C. L. Phillips, tool pusher, with W. M. Bailey, driller. Others, left to right: F. A. McNabb, Herbert Brandt, Bruno Lippke, Hugo Dieringer, and C. R. Hahn, crew members. (Courtesy Mission Manufacturing Co., Houston.)

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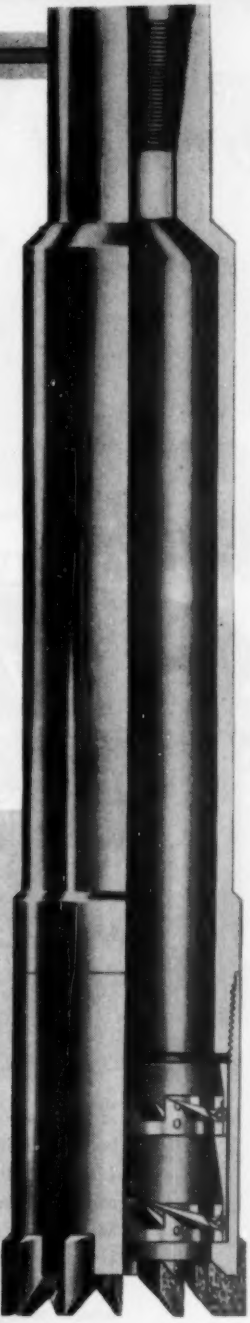

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Location of the test, 1 Rauckman, in the SE SE NE 11-8s-40w, is west of the old Goodland gas area, only production in that or adjoining counties.

Justiss-Mears Drilling Co., Jena, La., is drilling for Barnett Serio of Natchez, Miss., at a wildcat location, 1 Earnest Yount, in 45-7n-6e, 1½ miles southeast of Utility, in central Catahoula Parish, Louisiana. Hole is projected to the Wilcox.

Noble Drilling Corp., Tulsa, will drill another deep wildcat for the California Co. in the Bird Island area of Plaquemines Parish, Louisiana. Latest operation is 2-A State, located in 20-16s-17e. Contract is for 8,500 ft.

H. & S. Drilling Co., Tulsa, has taken on a 13,000-ft. Sunray Oil Corp. contract calling for a wildcat test to be drilled 3 miles southeast of Opelousas, in St. Landry Parish, coastal Louisiana. Location is for 1 Simon Lalonde, in 116-6s-4e.

Southern Production Co., Shreveport, has the contract for a 12,500-ft. wildcat test which the California Co. is starting at 1 Fairfax-Foster-Bailey, in 42-15s-9e, 2 miles southwest of Frankklin, St. Mary Parish, on the Louisiana Gulf Coast.

Survey Drilling Co., Dallas, has contracted for two additional wildcat tests to be drilled for Gulf Refining Co. in eastern Mississippi, one in Wilkinson County and the other in southern Adams County. The first will be 2 Armstrong, located in 7-4n-3w, 2 miles south of the Sibley field. Contract is for 7,200 ft. The other is 1 Catchings, in 1-3n-1e, 1½ miles south of Crosby, contracted for 7,500 ft.

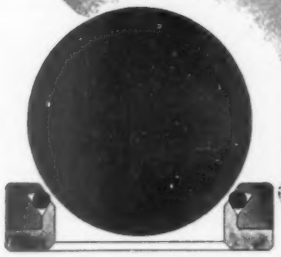
ACTIVE ROTARY RIGS*

(United States and Western Canada)

Area—	Week ended 6-23-52	Change week ended 6-16-52	Change week ended 6-25-51
Gulf Coast	614	+11	+ 28
N. & W. Tex.-N. M.	943	−31	+ 54
Ark.-N. La.-E. Tex.	160	− 1	+ 6
Oklahoma	326	−18	+ 37
Kans.-S. Neb.	160	−31	− 25
Illinois-Eastern	172	+ 9	+ 32
Rocky Mountains	244	+15	+ 78
Pacific Coast	168	− 1	+ 25
Total U. S.	2,787	−47	+235
Western Canada	172	−26	+ 44
Total	2,959	−73	+279

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the North and West Texas-New Mexico and Oklahoma-Kansas areas are shown on pages 154 and 155.

Absorb the SHOCK



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Where pitting and corrosion causes ball failures we offer the "Sheralloy" ball to mate with the stainless steel "O-Ring" seat. Prices for this combination furnished on request.

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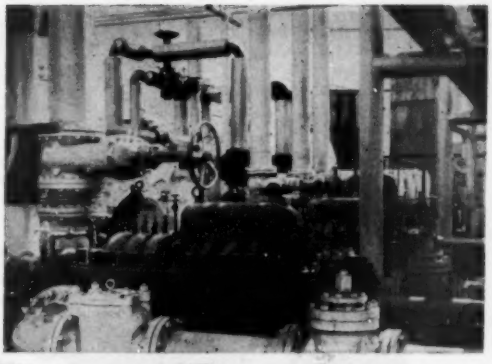

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The installation of Goulds 6-stage lean oil pumps shown above is in a Texas gasoline plant. Hundreds of these high-pressure centrifugals are operating today and many of them have been operating for years in the stations of prominent oil and pipeline companies.

Management prefers Goulds because they offer so much for the money. Engineers like their sound design and their wide range of ratings at maximum efficiency. Station operators choose Goulds because their simple construction reduces operating and maintenance problems.

Bulletin 722.4 describes the outstanding features of construction and gives complete specifications for Goulds High Pressure Centrifugal Pumps Figs. 3360 and 3365. Write today for a copy.

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Double-suction, single-stage Goulds centrifugals. Up to 15,000 G.P.M. Heads up to 500 ft. Bulletin 721.2.

"New Pyramid" double-acting piston pumps come in six sizes with capacity ranges from 7 to 58 G.P.M. Heads up to 580 ft.

"Support Head" Goulds centrifugals for general and many special liquid handling applications. Up to 4,000 G.P.M. Heads up to 400 ft. Bulletin 715.1.

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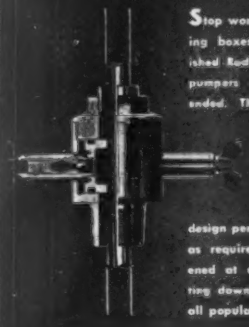

Stop worrying about leakly stuffing boxes. Install Kinzbach Polished Rod Stuffing Boxes on your pumpers and your worries are ended. They are plastic packed with a floating, self aligning gland and hold positive seals under the toughest conditions. Unique design permits plastic to be added as required or seal to be tightened at any time without shutting down the well. Available for all popular sizes of polished rods.

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LEADING THE FIELD OF SEISMIC EXPLORATION

Wilbarger County: Edwmond Spiers 1 Bates, 43-2-H&TC, dry, TD 4,882 ft.

Young County: T. V. Gorman 1 Prideaux, CTRR Sur., dry, TD 3,789 ft.

Eastern Texas

New Exploration Work Announced In East Texas

DALLAS.—New exploration work throughout East Texas were uppermost in the week's developments.

Fannin County received two new wildcats. J. J. Lynn, Abilene, will drill 1 John Black on a 200-acre lease in the W. H. Smith Survey, 1½ miles northeast of the town of Honey Grove. Projected depth was 10,000 ft.

U. S. Epperson Underwiring Co. 1-A Helton has been located 2 miles southeast of Bonham in the Daniel Young Survey. Contract depth was 9,000 ft.

In Camp County J. Z. Werby and others will drill 1 J. A. Braudaway to 8,200 ft. in the C. Dodson Survey, 5 miles north of Pittsburg.

In Wood County, F. R. Jackson and John C. Robbins, Jr. will drill 1 Emma Ivey as a 7,500-ft. wildcat. Location is in the G. W. Terrell Survey, 1 mile north of Mineola.

L. L. Horne, Dallas, has staked location for 1 Horne, 8,000-ft. Ellenburger test 8 miles south of Denton in Denton County. Drill site is on a 100-acre tract in the James Burke Survey.

In Hopkins County, H. L. Hunt 1 Bamburg was drilling in sand and shale below 7,981 ft.

General American Oil Co. of Texas 1 Delaney estate, wildcat 3 miles north of Quitman was drilling below 5,149 ft. on a 6,500-ft. contract.

EAST TEXAS (DISTRICTS 5 AND 6) SUCCESSFUL WILDCATS

Grayson County: Standard Oil Co. of Texas 1 W. H. Baker, A. Humes Sur., A-522, NW of Sherman, TD 9,427 ft., elev. 807 ft., top Ordovician lime pay 9,392 ft., IP 241 bbl. 40°-gravity oil, ¼-in. choke, TP 500 psi., GOR 1,126 cu. ft.

Harrison County: Tom Potter 1 Laura Shaw Est., J. R. Pace Sur., SW extension to 1 Cock, TD 6,741 ft., elev. 242 ft., perf. lower Pettit 6,684-95 ft., IP 60,000,000 cu. ft. of gas, plus 100 bbl. distillate a day, open 2-in. tubing, TP 760 psi.

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Lamar County: J. R. Dillon 1 M. L. Smiley, L. DeSavalla Sur., dry, TD 3,014 ft.

McLennan County: J. P. Cross 1 J. Muhl, T. D. Lavaga Sur., dry, TD 1,760 ft.

Navarro County: S. A. Cochran 1 W. W. Carter, Smith Gibbs Sur., A-312, dry, TD 1,259 ft.

Smith County: Trans-Tex Drilling Co. 1 B. W. Gaston, I. Splawn Sur., dry, TD 5,645 ft.

Zephyr Oil Co. 1 R. L. Bergfield, R. McGill Sur., dry, TD 7,106 ft.

Wood County: Hollandsworth Oil Co. 1 Wood County Mining Corp., Wm. Clark Sur., A-99, dry, TD 5,728 ft.

Permian Basin

Shallow Permian Strike Made In Kent County

MIDLAND.—Shallow discoveries and extension wells were in the week's developments. In Kent County, about 2 miles east of the Cogdell area, Chapman & McFarlin Producing Co. 1 Cogdell, 775-97-H&TC, first developed oil-cut mud on a test in the Permian limestone from 4,540-58 ft.

Second test from 4,540-73 ft. had gas in 18 minutes and oil at the surface in 1 hour and 40 minutes but was not allowed to flow. A test from 4,573-4,619 ft. recovered 700 ft. of oil and 360 ft. of salt water. Drilling continued below 4,746 ft.

In Midland County, Superior Oil Co. completed its 4-16 Windham as a north extension to Ellenburger production in Pegasus field. Initial potential, without acid, was 475 bbl. of 53°-gravity oil a day through 10/64-in. choke from open hole at 13,154-245 ft. The well may prove a separate structure from Pegasus in that it produces from a horizon that is said to be below the water level of nearby Ellenburger wells.

Atlantic Refining Co. 1-C University, 2 miles south of Barnhart-Ellenburger field of southeast Reagan County, flowed 165 bbl. of oil in 24 hours from perforations at 9,060-9,124 ft. in the Ellenburger. Rotary was being moved off for further tests. Location in SW SW of Section 19 is ½ mile east of an Ellenburger failure. Atlantic staked location for a second test as the 1-D University, north-

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sand and shale below

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STRICTS 5 AND 6)
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east of the extender, in SE NW of Section 19.

Humble Oil & Refining Co. 1 Rawlings Pennsylvanian discovery 3 miles north of Bronte in Coke County, completed for 298 bbl. of 49°-gravity oil. Completion was through 12/64-in. choke on perforations from 5,298-5,343 ft. The 1 Rawlings was dry in the Ellenburger, topped at 5,574 ft., minus 3,691 ft., but had further oil shows in the Palo Pinto and the Goens limestone, both of Pennsylvanian age.

Further Mississippian oil for northwest Scurry County has been indicated at Superior and Intex 1-515 Laws, wildcat in 516-97-H&TC. Drill-stem test from 8,169-8,227 ft. recovered 3,700 ft. of gas, 40 ft. of oil and gas-cut mud, 90 ft. of heavily oil-cut mud and 90 ft. of mud-cut oil.

Standard Oil Co. of Texas 1 Minnie Adams, prospective Floyd County discovery, made two flows of gas, and after being open about 10 hours, started flowing oil. It gaged 10, 12 and 13 bbl. in 3 hours, then fell off rapidly the fourth hour when it made 1 bbl. The section tested was from 7,600-80 ft. Recovery was 7,500 ft. of oil with no water.

Anderson-Prichard Oil Corp. 1 Fasken-24, Ellenburger wildcat in southeast Andrews County, recovered 45 ft. of oil and gas-cut mud on a 1-hour drill-stem test in the Wolfcamp at 8,350-76 ft., and 180 ft. of oil and gas-cut mud in 3 hours at 8,350-8,414 ft. Projected depth was 14,000 ft.

Jackson, Douglas & Whitaker 1 Evelyn Lineberry, originally an Ellenburger wildcat about ½ mile northwest of Fullerton field in Andrews County, found a shallower pay and was to complete from the San Angelo section of the Permian. Completion was to be attempted from perforations at 4,680-90 and 4,600-45 ft. According to field reports, it is a new and higher pay for the Fullerton field.

Atlantic 1-29 Sugg in 29-A-TCRR, extended Spraberry production south of Weddell field and gave Tom Green County its first Spraberry well. The well gaged 122 bbl. of new oil in 22 hours, flowing through ½-in. choke on perforations at 5,022-40 ft.

Humble has announced an Ellenburger wildcat to be drilled on land owned by George T. McEwen, just north of Lake View in Tom Green County. Location is on a block of approximately 4,500 acres, including some 1,500 acres inside the city limits of Lake View. A company rig was to be moved in from the Spraberry fields.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Gaines County: Aurora Gasoline Co. 1 M. S. Doss, 398-G-CCSD&RGNG, TD 9,883 ft., elev. estimated 3,426 ft., Devonian 9,570 ft., pay 9,677 ft., IP pumped 218 bbl. 36°-gravity oil.

Reagan County: Cities Service Oil Co. 1 Nunn, 3-B-L&SV, TD 7,578 ft., elev. 2,683 ft., Spraberry 6,545 ft., pay 6,568 ft., IP 359 bbl. 38°-gravity oil, 35/64-in. choke, TP 90 psi., GOR 704 cu. ft.

Upton County: Oscar Bourg Drilling Co. et al 2 University, 18-15-University, TD 8,700 ft., Strawn 8,560 ft., IP 250 bbl. 40°-gravity oil, 27/64-in. choke, TP 100 psi., GOR 1,359 cu. ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Borden County: Phillips Petroleum Co. 1-A Dennis, Sec. 62, Georgetown RR Sur., dry, TD 9,073 ft., elev. 2,683 ft., Spraberry 5,694 ft., Strawn 8,170 ft., Ellenburger 8,982 ft.

Cochran County: Cosden Petroleum Co. 1 L. P. Barker, 2-V-PSL, dry, TD 9,061 ft., elev. 3,770 ft., Ellenburger 8,370 ft.

Cottle County: Sun Oil Co. 2 Hughes, Sec. 2, F. P. Knott Sur., dry, TD 7,260 ft., elev. 1,816 ft., reef 4,690 ft., Mississippian 7,242 ft.

Crosby County: Sinclair Oil & Gas Co. 1 Clark Wood, 13-B9-EL&RR, dry, TD 9,168 ft., elev. estimated 2,735 ft., Spraberry 5,343 ft., Pennsylvanian 8,232 ft., Ellenburger 9,089 ft.

Irion County: Anderson-Prichard Oil Corp. 1 Calvin Sugg, Sec. 51, Blk. A, dry, TD 5,144 ft., Spraberry 4,990 ft.

Midland County: Magnolia Petroleum Co. 1 C. L. Klapproth, 14-38-T2S-T&P, dry, TD 12,864 ft., Spraberry 7,694 ft., Pennsylvanian 10,555 ft., Mississippian 11,613 ft., Devonian 11,818 ft., Ellenburger 12,770 ft

Pecos County: Hassie Hunt 1 H. A. Wimberly, Sec. 2, Blk. 100, dry, TD 11,122 ft., elev. estimated 3,390 ft., Canyon 7,990 ft., Simpson 8,630 ft., Ellenburger 10,550 ft.

Reagan County: Russell, Havenstrite and Rawn 1 Susan Patterson, Sec. 1,947, SA&MG, dry, TD 7,000 ft., elev. 2,615 ft., Spraberry 6,360 ft.

Runnels County: Hanco Oil & Gas Co. 1-A Hall, Sec. 152, L. Fitz Sur., dry, TD 4,412 ft., elev. 1,726 ft., Gardner 3,830 ft., Caddo 4,110 ft., Ellenburger 4,258 ft.

Guy Mabee Drilling Co. 1 A. S. Alcorn, Sec. 124, ETRR, dry, TD 3,900 ft.

Tom Green County: Louis B. Williams 1-A Ohio Oil Co.-Bryand, Sec. 1,029, dry, TD 401 ft.

Upton County: Glasco & Greer 1 Tom Owens, 19-B-GC&SF, dry, TD 11,669 ft., Spraberry 6,717 ft., Devonian 10,232 ft., Ellenburger 11,576 ft.

Texas Pacific Coal & Oil Co. 1 George Long, Sec. 3, RT Co. Sur., dry, TD 9,091 ft., elev. 2,662 ft., Devonian 7,120 ft., Simpson 7,910 ft., Ellenburger 8,810 ft.

Yoakum County: Coline Oil Corp. 1-881 Willard, Sec. 881, Gibson Sur., dry, TD 8,230 ft., San Andres 5,013 ft., Glorietta 7,060 ft.

SOUTHEAST NEW MEXICO

The Texas Co. 1-BB State, 11-12s-32e, completed for an estimated daily potential of 2,040 bbl. of oil a day, based on a 6-hour flow of 510 bbl. of oil through ½-in. choke from Devonian perforations at 11,162-92 ft. Location is a north offset to Amerada Petroleum Corp. 1-ECA State, discovery well. The 1-BB State is the second well for the new pool.

The Texas Co. 1-AY State, wildcat in 35-19s-37e, swabbed 48 bbl. of fluid in 4 hours from perforations at 12,013-129 ft. The fluid was 95 per cent water and the balance sediment and oil. New perforations were to be made from 11,973-12,013 ft.

Cities Service Oil Co. 1-B State, 36-13s-37e, indicated second producer for the new Pennsylvanian area between Denton and Gladiola pools, found the water table in drill-stem testing from 10,723-52 ft. Recovery in 5 hours was 900 ft. of oil, 180 ft. of oil and gas-cut mud and 470 ft. of salt water. Previously the well unloaded oil on a test from 10,539-60 ft. and had good oil recoveries from 10,538-84 and 10,684-712 ft.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: The Texas Co. 1-AW State, 21-10s-37e, TD 12,190 ft., elev. estimated 3,960 ft., Devonian 12,014 ft., pay 12,057 ft., IP 899 bbl. 40°-gravity oil, 1-in. choke, TP 90 psi., GOR 650 cu. ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Lea County: Cactus Drilling Corp. 1 W. A. Cline-Federal, 13-23s-37e, dry, TD 10,287 ft. elev. estimated 3,348 ft., Drinkard 6,460 ft., Abo 6,730 ft., base Pennsylvanian 7,490 ft., Simpson 9,390 ft., Ellenburger 10,150 ft.

Canadian Fields

Initial Test Completed At St. Luke Ann Well

CALGARY.—The first well to indicate commercial oil production from the D1 zone of Devonian in Alberta has completed its initial production tests and rated a potential of 75 bbl. daily. The product is a medium gravity oil of 23° API. The discovery well is in the Lake St. Ann area of central Alberta, approximately 30 miles northwest of Edmonton. Other wells in Alberta have shown some oil in the D1, but prior to the Lake St. Ann well none had produced in commercial volume.

This discovery was made at Placid 1 Lake St. Ann wildcat, which lies on LSD 15, 16-55-2w5, some 10 miles east-southeast of Texaco A-1 Glenevis Madison oil discovery well. Placid Oil Co. private firm from Shreveport, La., drilled the venture on farmout lands acquired from the Texaco Exploration Co.-McColl Frontenace Oil Co., Ltd., team and received first indication of discovery during drill-stem tests in January of this year. It is understood that drill-stem tests at that time, below 4,550 ft., gave up over 600 ft. of medium gravity crude oil, from the Juno dolomite section of the D1 Devonian zone.

The 1 St. Ann well was carried down to 6,355 ft. as a test of the lower Devonian zones, and then plugged back for an extended test period in D1. String of 7-in. production casing was set at 4,702 ft. and hole was perforated from 4,556-80 ft., 4,583-88 ft., and 4,594-4,603 ft. The production is believed to have been encountered around 50 ft. below the D1 contact, and a reported 35 ft. of pay zone is present. On a pump potential test recently run, the Lake St. Ann well yielded the 75 bbl. of 23°-gravity crude oil, with less than 1 per cent water cut, according to report from Placid officials.

The Tide Water Associated Oil Co., group, a team of four American oil firms that is carrying out an intensive exploratory program in Saskatchewan, has discovered medium gravity crude oil at its wildcat in the Eastend are of southwest Sackatchewan, about 32 miles north of the U. S. border and 63 miles east of the Alberta boundary.

The strike, Tide Water 1 Eastend Crown on LSD 15, 11-6-20w3, is the Tide Water group's first oil discovery in Saskatchewan. It was made in the Jurassic formation, about 54 miles south of the Socony Western Prairie 1 Midway wildcat which discovered oil in two zones of the Jurassic earlier this month.

First drill-stem test reported at the Eastend discovery was run in the Jurassic interval 4,740-58 ft., and yielded a 1-hour recovery of 225 ft. of clean oil. One hour test from 4,756-68 ft. gave up 60 ft. of oil-cut mud. Latest drill-stem test of interval 4,768-78 ft. yielded no sign of formation water in either of the tests. Company officials stated that gravity of the oil was estimated from 20-21°.

The team of Phillips Petroleum Co. of Oklahoma and Husky Oil & Refining, Ltd., has indicated discovery of heavy crude oil at two wildcats in the west sector of Saskatchewan 6 miles south of the Coleville heavy crude oil field. The two wells are about 7 miles apart, with the most westerly venture being some 23 miles east of the Phillips-Husky team's heavy crude oil discovery that was made at Hoosier in early

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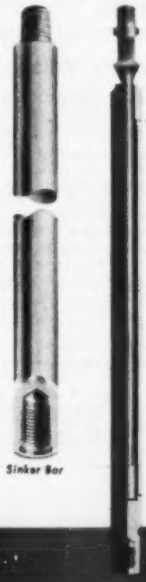

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May of this year. The discovery wells showed crude oil with gravity from 10-12°.

One of the discoveries is in the St. Eloi area, about 5½ miles southeast of Coleville production. This venture, Phillips-Husky 1 St. Eloi is on LSD 13, 28-30-23w3. In addition to having oil-bleeding cores in the Viking, this well indicated heavy oil in the Lower Cretaceous and Banff sands.

The other strike was made at Phillips-Husky 1 St. Florence, a venture located about 7 miles west of St. Eloi. This site is on LSD 12, 29-30-24w3, some 5 miles south of Driver Viking sand light oil discovery well and 23 miles east of Husky-Phillips Hoosier area heavy crude oil discovery well. A moderate flow of Viking gas was found at this venture, with cores in that formation bleeding light oil. The Banff section also gave up some heavy gravity oil. Crew is now preparing to run production casing at bottom 2,760 ft.

CANADIAN SUCCESSFUL WILDCATS

Shell 1 Olds, LSD 16, 11-32-1w5, TD 10,411 ft., capped potential gas well.

Central Del Rio 1 St. Albert LSD 5, 7-54-25w4, TD 3,883 ft., on production; oil well.

CANADIAN WILDCAT FAILURES

Castle Leduc Albedena-Areman, LSD 9, 35-47-21w4, TD 4,185 ft.

Imperial 5-29B Morinville, LSD 5, 29-56-24w4, TD 3,544 ft.

Leduc Calmer 3 Oiliver Lake 3, LSD 7, 17-50-21w4, TD 4,260 ft.

Oklahoma

Beaver County Wildcat Gets Oil-Gas Showings

SPREADING exploration in Beaver County, in the Panhandle, received additional encouragement during the week by promising oil and gas showings which Carter Oil Co. obtained in its 1 Dorman, C NW NW 29-5n-22eCM, a wildcat located about 4 miles south of the recently opened Greenough pool, in the northwestern part of the county.

Showings in this wildcat were in a lime formation, possibly the Lansing, from which, in a 2-hour drill-stem test of an interval at 5,263-76 ft., a recovery of 3,150 ft. of gas, 100 ft. of 38.5°-gravity oil, and 10 ft. of heavily oil-cut mud was made. No water was indicated in this test, but in another test, with hole cored to 5,281 ft., 35 ft. of water showed up along with 40 ft. of oil-cut mud. The latter test, taking in the interval below 5,273 ft., was open 1 hour.

The discovery well, and so far only producer in the Greenough pool, produces from Oswego lime at 5,833-49 ft. That well is Carter Oil Co. and Emby Kaye 1 Sid Sharp. A southwest 40-acre offset, 1 Grove, C NW NE 6-5n-22eCM, is drilling below 6,400 ft. without getting the pay. The east offset, 1 Breen, C SW SW 32-6n-22eCM, was not down to the pay at latest report.

Latest addition to the wildcat play in the county is a test, 1 Barby, which Lawrence and J. Lee Youngblood are starting in the C NW NW 28-6n-26eCm, on a block located north of Pure Oil Co.'s recently completed Morrow sand, gas-discovery well (Northwest Knowles pool), 1 Albert, in the northwestern part of the county. There now are 12 active operations in the county. Except for the two Greenough confirmation tests, all are wildcats.

Southwestern Lincoln County has a prospective new producing area where a wildcat, 1 Ewing, drilled by W. F. Snarkard, is reported to have flowed a substantial volume of gas, estimated at a rate of nearly 20,000,000 cu. ft. per day, with some oil, after casing was perforated opposite an indicated Skinner sand pay zone at 4,594-4,604 ft. The well, located in the NW NW NE 12-13n-2e, several miles west of the Happy Hill area, previously had been drilled to the second Wilcox sand, logged at 5,328-48 ft., which was not productive. Locations have been made for two 40-acre offsets, one by the same operator at 1-B Ewing, to the south, and the other by A. R. Jordon at 1 Orr, to the west.

Confirmation of the Wilcox sand production found by the discovery well of the recently opened Southwest Sporn field in northwest Lincoln County, is being given at the discovery well's northeast offset, George Puckett 1 Westfall, SW SW SE 21-17n-3e, which flowed 175 bbl. of oil in a 13½-hour run while testing the pay at 4,878-84 ft. (open hole). The discovery well, Arthur Finston 2 Dumas, NW NW NE 6-16n-3e, was completed in April as a 55-bbl. pumper. One other producer has been completed in the field. It failed in the Wilcox, but made a well in the Red Fork sand, perforated at 4,256-62 ft.

Gulf Coast Western Oil Co. and William Broadhurst 1 Croom, SE SW SE 20-4s-1e, ¾ mile southeast of the discovery well of the new Northeast Lone Grove pool, Carter County, swabbed at the rate of ½ bbl. of oil per hour while testing open hole in reported Springer sand at 6,300-35 ft. Hole now is being deepened with cable tools for further testing. The discovery well, Sinclair Oil & Gas Co. 1 Brown, C SW NW 20, completed last month, produces from the lower Dornick Hills pay, opposite which casing is perforated at 5,624-66 ft.

Simpson-Fell Oil Co. 1 Walker, SE SW NW 10-4s-2w, deep exploratory test on the north flank of the shallow Hewitt field, also in Carter County, got some free oil along with 45 ft. of heavily oil and gas-cut mud in a 60-minute drill-stem test at 6,934-54 ft. in Deese sand, but is drilling ahead.

OKLAHOMA SUCCESSFUL WILDCATS

Lincoln County: Skiles Oil Corp. 1 Geo. Smith "A," NE SW NE 2-12n-3e, flowed 16½ bbl. of oil from Prue sand 4,066-80 ft., TD 4,080 ft.

Sinclair Oil & Gas Co. 4 Rice, SW SE NE 33-13n-3e, pumped 78 bbl. of 37°-gravity oil from Red Fork 4,838-48 ft., TD 4,652 ft., PBTD 4,648 ft. (new pay in NE Mammoth pool).

Okmulgee County: R. O. Lee et al 1 Lee, NW NW SE 26-16n-12e, pumped 10 bbl. from Red Fork 1,245-62 ft., TD 1,262 ft. (extends Mounds pool).

OKLAHOMA WILDCAT FAILURES

Grant County: C. E. McCaughey 1 Park et al, C SW NE 25-25n-4w, dry, TD 6,145 ft.

Greer County: D. H. Bolin 1 Rutter, NE NE SW 24-5n-23w, dry, TD 3,434 ft.

Jackson County: Sohio Petroleum Co. 1 Grider, NW NE SW 13-2n-21w, dry, TD 3,940 ft.

Kiowa County: Stanolind Oil & Gas Co. 1 Stuckey, NW NW SW 5-7n-15w, dry, TD 6,504 ft.

Liincoln County: E. C. Tinsley 1 Drabek, NE NE SW 34-13n-6e, dry, TD 4,487 ft.

W. O. Allen, Jr. and Johnny Halke 1 Anna Ringer, NE SE SE 30-14n-5e, dry, TD 3,667 ft.

Arthur Finston 1 Decker, NE NE NE 1-15n-2e, dry, TD 4,580 ft.

Love County: The California Co. 1 Kunkel, SE SE NE 10-8s-1w, dry, TD 7,151 ft.

Murray County: Sam Mizel 1 Black James, SW NE 29-2s-3e, dry, TD 2,175 ft.

Pontotoc County: Mid-Continent Petroleum Corp. 1 Jenkins, SW NE SW 21-4n-4e, dry, TD 1,638 ft.

Southwest Texas

Fishing Job Under Way At Wilson Test

CORPUS CHRISTI.—In Wilson County, H. J. Mosser is fishing for drill pipe at the 1 Isabel Fahrenthold around 3,900 ft. A cavity was encountered after drilling one foot into the Georgetown at 7,641 ft. The top of the Georgetown was called at 7,640 ft. Coring was started at 7,430 ft. and well has been cored continuously from that point. Location is in the Manuel Barrera Grant, Survey 26.

Daubert and Achning have deepened the I C. Scheuenemann to 5,330 ft. after having previously abandoned it at a depth of 5,012 ft. The well was deepened to the Stillwell sand where the well flowed an estimated 40-50 bbl. of oil per day through perforations at 5,317-27 ft. Location is on the San Antonio de Agua Dulce Grant in Jim Wells County.

It has been reported that A. B. Williams 1 Hal Peterson had an oil show from 845-895 ft. with an estimated 40-60 per cent oil stain. Operator is preparing to set casing to approximately 900 ft. and acidize. Location is on the GWT&P RR Co. Survey, Real County.

Gasoline Production Co. and Monterey Oil Co. have staked location for a 3,800-ft. wildcat test in Frio County. Location for the 1 J. W. Claiborne is on the Rusk Transportation Survey, A-508. Production is from two zones in the Navarro; one is the Almos zone around 3,211 ft. and the other zone is around 3,900 ft.

Magnolia Petroleum Co. is drilling ahead below 8,670 ft. at the 1 Walter Spahn after pulling core 45 from 8,720-70 ft. with no shows of commercial importance.

Pryor Dillard has cored the Buda limestone from 1,109-17 ft. with recovery being sandy lime with a show of oil. Operator is preparing to set 5½-in. casing to 1,109 ft. and test open hole at the 1 William Z. Zabeik. Location is on the Thornton Stone Survey, Bell County.

Jake L. Hamon, Edwin L. Cox and George H. Coates have staked location for a 5,700-ft. test as the 1 J. T. Rogers, El Mesquite-Trinidad Vela, Grant A-612, Duval County. A second test is being staked on the same Grant, and will be the A-1 Alonzo Taylor "A."

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Duval County: David L. Gordon 1 Dario Salines, La Huerta Grant, A-227, TD 6,822 ft. Frio production zone, perf. 4,503-7 ft., IPF 83 bbl. oil per day, 12/64-iin. choke, 45.1° gravity

San Patricio County: La Gloria Corp. 1 H. G. Ritchie, 4th Addn. of Taft Farm Lands, Sec. 44, TD 8,604 ft., perf. 8,472-77 ft., IPF 105 bbl. oil per day on choke, 41° gravity.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Atascosa County: Orion Oil Co. 1 Geo. R. Kitchen, Sur 118, dry, TD 3,950 ft.

Ryan, Hays & Burke 1 Mary O. Miller, Galba Fuqua Sur., A-271, dry, TD 1,691 ft.

Texita Oil Co. and R. D. Mebane 1 C. L. Robbins, Galza Fuqua Sur. 1181, A-271, dry, TD 1,696 ft.

Bexar County: Karl W. Arnold 1 C. A. Goeth, Jose de la Garza Sur., dry, TD 2,050 ft.

Willard Shuart 1 Edwin Eckert, M Manchoca Sur., Sec. 52, dry, TD 3,400 ft.

Caldwell County: BBBC Oil Royalty Co. 1 Ben Ranch, Cornelius Crenshaw Sur., dry, TD 1,639 ft.

Duval County: J. W. Gorman 1 Baker-Neely, Geo. Lichtenberger Sur., 220, dry, TD 4,265 ft.

Milam County: Alvin Shambeck 1 Doyle Harrison, ESC Robinson Sur., dry, TD 1,685 ft.

Starr County: Hawn Bros. et al 1 H. B Guerra Sur. 270, A-943, dry, TD 7,022 ft.

Webb County: American Liberty Oil Co. 1-A O. G. Kirkpatrick, CCSD&RGNG Sur. 116, dry, TD 502 ft.

Long Bros. and Sid Katz 1 Dr. Raul de la Garza Sur. 262, dry, TD 2,770 ft.

G. G. Mortimer, Jr.-Edwin L. Cox 1 Moose et al, CCSD&RGNG Sec. 20, dry, TD 3,200 ft.

Appalachian-Ohio

Chert Reached At Deep West Virginia Test

PITTSBURGH.—In Williamsburg district, Greenbrier County, West Virginia, Deep Rock Oil Corp. 1 Bertha H. Thornbury et al is now drilling at 6,618 ft. Portland district, Preston County, Hope Natural Gas Co. 9670 B. & O. R. R. Co., is drilling at 814 ft. and Manufacturers Light & Heat Co. 4116 Enzer and Annie E. Whitehair at 5,410 ft. Union district, Hope Natural Gas Co. 9699 D. C. Bishoff, elevation 1,892 ft., ran 7-in. casing at 4,825 ft. The chert was reached at 4,823 ft. Union district, Pendleton County, Seneca Gas & Oil Co. 1 Neil Harper is drilling at

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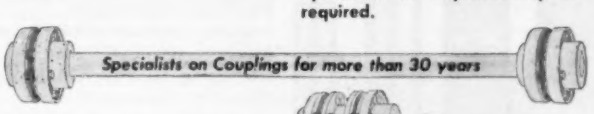

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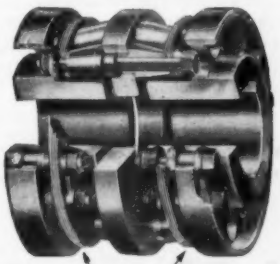

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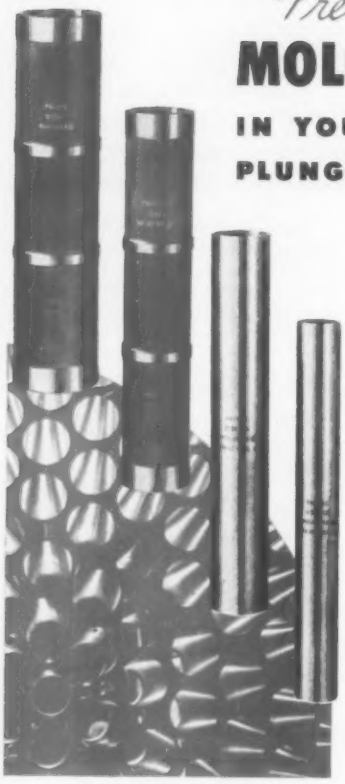

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2,436 ft. Jumping Branch district, Summers County, United Fuel Gas Co. 1-6788 J. Sanford Lilly is shut down at 4,300 ft.

Maryland.—Garrett County: Cumberland & Allegheny Gas Co. 2 Jasper Riley, elevation 2,399 ft., received the Tully lime at 2,635-48 ft., and is drilling at 2,654 ft. Ray Kite 1 Alvin Friend recorded additional gas at 3,918-22 ft., testing 200,000 cu. ft., and is shut down. New York State Natural Gas Corp. 247 Shaw is drilling at 7,053 ft.

Pennsylvania.—Unity Township, Westmoreland County, Southwest Pennsylvania: Peoples Natural Gas Co. 4003 A. J. Dotterway, elevation 2,94 ft., is drilling at a depth of 8,294 ft. and 4008 J. R. Frola is running casing at 2,505 ft.

OHIO

John Morrow et al. moved ½ mile northeast of their extension on Charles Horn and found a good showing of oil in the 1 W. F. Heffelfinger, Lot 12, New Castle Township, Coshocton County. Clinton sand was found at 3,131-85 ft. with 32 bbl. natural, and will probably be shot as soon as the casing is landed.

Wiser Oil 1 Lee Black, Section 5, Tiverton Township, Coshocton County, a ½-mile northeast extension, logged the Clinton at 2,958-3,015 ft. with a fair showing of oil natural that increased to 50 bbl. in 24 hours after a 90-qt. shot.

Oxford Oil 1 Henry S. Orr, Section 19, Hopewell Township, Licking County, made 73 bbl. in 24 hours after a 120-qt. shot. Clinton sand was found at 3,186-98 ft. with a good showing natural. The producer is along the south edge of the old Flint Ridge pool.

Texas Gulf Coast

Harris Well Indicates New Production Level

HOUSTON.—Production Maintenance Co. 1 J. C. Guhn has indicated new production from the 7,240-ft. level. Well is located south of Fairbanks field in Harris County. The 1 Guhn was drilled to a total depth of 7,907 ft. and 5½-in. production string was set at 7,400 ft. for the completion attempt. The well made a good flow of oil from perforations at the 7,240-ft. level, but later died, and operators ran bottom-hole pressure tests and productivity index tests in the hole.

J. M. West 2 Olla Heath Garrett, deep wildcat in Grimes County, near the Madison County line, has drilled to a depth of about 9,470 ft. in the Buda lime, and ran drill-stem test of open hole. Previous test at 8,461-8,766 ft. had flowed dry gas with 1,930 psi., and later test at 8,460-9,134 ft. had flowed gas at the rate of 250,000 cu. ft. per day on 24/64-in. choke, with 1,200 psi. tubing pressure, plus 20 to 25 bbl. of distillate per day. Well is in the A. B. Dodson Survey, A-174.

American Republics Corp. and Houston Oil Co. of Texas have entered the new Hardin County gas area opened recently by the Meredith, Clegg and Hunt 1 Bruce Jackson et al. The joint operators staked their 1 Henry Binns Fee as a 9,500-ft. test in the Binns League, A-6, about 1,000 ft. northwest of the new discovery.

Anderson-Prichard Oil Corp. is preparing to run tubing for completion of its 1 R. A. Johnson in Colorado County as a gas-distillate well. This completion opens new production about 1½ miles north-northeast of the present production at Frelsburg field. Perforations

for the completion try were made at 9,652-64 ft. with 48 jet shots. A drill-stem test was run on these perforations, using packer at 9,630 ft., and ⅜-in. bottom choke, ¼-in. top choke. On a 10-hour test well flowed 1,300,000 cu. ft. of gas and had an average of 4.69 bbl. of fluid per hour, some of its being mud. Working pressure varied from 1,200 to 2,000 psi. Hole was drilled to a total depth of 11,154 ft. in the Wilcox zone before the production tests were started.

Meredith, Clegg and Hunt et al. have completed their wildcat discovery in Hardin County as a gas well. The 1 Bruce Jackson et al. was reported to have been shut in for potential test following the completion, and to have a shut-in pressure of 2,870 psi. Open flow estimate was around 28,000,000 cu. ft. gas per day. The well was drilled to a total depth of 8,511 ft. and casing was set near bottom at 8,510 ft. Perforations were made in a series between 8,150 and 8,205 ft. in the Wilcox zone. Location of the new gas discovery is in the Henry Binns League, A-6.

Floyd L. Karsten has run tubing for production test in his C-1 Grogan Mfg. Co. "C" well in Liberty County. This wildcat discovery prospect was drilled to a total depth of 9,900 ft. and has 5½-in. casing set to an undisclosed depth. No information is being released at this time on the level to be tested, but current reports are that a gas-distillate sand was logged in the Wilcox zone below 8,800 ft.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCAT

Wharton County: Charles H. Osmond 1 Lacy Armour et al, Charles Howard Le., A-181, TD 5,348 ft., IPF 29,000,000 cu. ft. gas per day, open flow, GOR dry gas, no water flowed 1,700,000 cu. ft. gas per day on ¼-in. choke, TP 1,716 ft.

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TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Bee County: Pratt-Hewit Oil Corp. et al 1 Dan J. Fox, Michael Fox Sur., dry, TD 5,076 ft.

Brazoria County: Skelly Oil Co. 1 C. E. Wissner, Francis Moore Sur., A-100, dry, TD 10,899 ft.

Colorado County: Fidelity Oil & Royalty Co. 1 Florance Dodson, George Wright Sur., A-583, dry, TD 10,415 ft.

Goliad County: Jake L. Hamon, Edwin L. Cox and Dan Auld, 1 J. O. Crell, Jose Santos Sur., dry, TD 7,910 ft.

James G. McGarrick 1 Annie D. McGlothing, Maria de Jesus Ybarbo Sur., dry, TD 9,252 ft.

Louisiana-Ark.

Two Wildcats Fail In Arkansas

SHREVEPORT.—Lawton Oil Corp. 1-A Russell Goode, near Atlanta field, C SE SW 36-18s-19w, which drilled to 9,415 ft., plugged back to 8,510 ft., was abandoned as dry. McCord and Logan have abandoned as dry 1 Allie Vaughan in NW 3-17s-20w, 2½ miles from Magnolia field.

Shell Oil Co. is drilling ahead for a test in the Smackover at 1 Browning-Burns unit in 12-20s-23w, near Springhill field. Operators plan to drill to 11,500 ft. Present depth is 10,500 ft.

Louisiana.—O. G. Martin and Finn Myrdahl et al 1 Herold-Wallace, 350 ft. from south line and 720 ft. from west line in 2-17n-15w, Caddo Parish, is waiting on gage. The wildcat is located 3¾ miles west of Shreveport. The well tested 1,250 M.c.f. of gas per day from reperforations in Paluxy at 2,520-21 ft. Tubing pressure was 795 psi., shut in pressure 1,250 psi. Total depth is 6,300 ft.

W. G. Skelly 1 W. G. Skelly fee, 2,412 ft. from east line and 1,880 ft. from north line in 6-23n-15w, Caddo Parish, is waiting on orders with total depth at 11,800 ft. The wildcat tested dry from perforations 6,710-30 ft. in Pettit after acid treatment.

In De Soto Parish Lawton Oil Corp. 1-A Mansfield Hardware Lumber Co., 2,320 ft. from north line, 1,648 ft. from west line in 3-10n-11w, tested salt water with a show of oil on reperforations at 4,132-41 ft. and is waiting on orders. The wildcat is located 3¼ miles southwest of Butler field. Total depth is 5,971 ft.

The California Co. 1 Long Bell recovered red mud-cut salt water with oil traces on a drill-stem test at 8,772-9,010 ft. and is coring at 9,203 ft. The wildcat is located in 9-1n-3w, Rapides Parish, 3 miles southwest of Melder.

LOUISIANA SUCCESSFUL WILDCAT

Union Parish: Shell Oil Co. 1 Andrews, 713 ft. north and 608 ft. west SEc 34-23n-2e, pumped 10 bbl. of oil from Cotton Valley 5,514-19 ft., TD 8,235 ft. PBTD 5,521 ft. Discovery called Marion.

LOUISIANA WILDCAT FAILURES

Concordia Parish: H. W Todd Oil Co. 1 Gibson, C NE NW 22-6n-6e, dry, TD 6,128 ft.

Barnett Serio et al 1 Cox, 2,310 ft. east and 380 ft. south NWc 34-6n-6e, dry, TD 6,505 ft.

Jackson Parish: Whitclay Oil Operators, Inc., 1 Tremont Lumber Co., C NE SE NW 31-15n-1w, dry, TD 10,002 ft.

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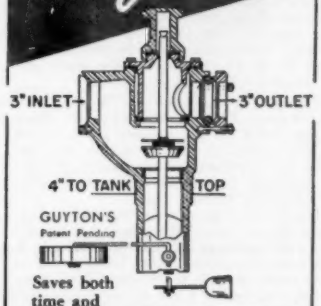

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ARKANSAS WILDCAT FAILURES

Ashley County: Lion Oil Co. 2 Crossett Lumber Co. "B," C NE NE NE 28-18s-5w, dry, TD 3,513 ft.

Clark County: H. M. Mills et al. 1 Cabe, 616 ft. south and 330 ft. west NEc SE¼ 3-10s-20w, dry, TD 1,503 ft.

Hempstead County: Broday Drilling Co. 1 King, C SE NW SE 35-12s-25w.

Miller County: Lyons, McCord & Logan 1 Nancy Mills, C E½ NE NE 16-17s-27w, dry, TD 4,110 ft.

Mississippi

Forrest Well Awaits Final Gage

JACKSON.—Ohio Oil Co. 1 Coleman-Powe, Section 5-1s-12w, in Maxie field, Forrest County, Mississippi, is still testing and final completion gage has not been announced. During the past week the well flowed at the rate of 8,113 M.c.f. gas plus 167 bbl. of 59°-gravity condensate per day on 25/64-in. choke with tubing pressure 2,453 psi. The smallest choke used while testing was 14/64-in. On this choke, the well flowed at the rate of 3,003 M.c.f. gas plus 55 bbl. of condensate with tubing pressure 2,766 psi. It is reported that preliminary calculated open-flow potential was 32,000 M.c.f. gas per day. These tests were from perforation 7,303-20 ft. It will be recalled that gas and condensate were recovered from tests of perforations 8,318-42 ft. opposite Lower Tuscaloosa sand. A bridge plug was set above these lower perforations before present perforations were shot.

Gulf Refining Co. 1 Chapman, Section 19-10n-6w, Wayne County, Mississippi, has been put on the pump. During the 11 days from June 7 through June 17 the well averaged pumping 84 bbl. of 39.2°-gravity oil plus 169 bbl. of salt water per day. This well is producing from perforations 9,595-9,608 ft. opposite Lower Cretaceous sand.

A deep test in South Carlton field, Clarke County, Alabama, the Humble Oil & Refining Co. 1 Williams et al., Section 10-3n-2e, is reported coring below 14,034 ft. Three cores had been cut from 13,930 to 13,983 ft. with recovery being shale, anhydrite, and dolomite with no shows. No top of the shape and evaporite section has been reported.

Lion Oil Co. 2 Denkmann, Section 22-7n-4e, Rankin County, Mississippi, is being plugged back to test possible shows in the Cotton Valley. It will be recalled that this deep test recovered noninflammable gas (carbon dioxide) from three sand zones between 15,100-16,276 ft., total depth.

Sun Oil Co. 1 Hurst et al., Section 8-1s-17w, Pearl River County, Mississippi, has set casing and is starting to test shows of gas in the lower Tuscaloosa. After being drilled to total depth of 9,473 ft. in Lower Cretaceous, casing was set to 9,100 ft. Log and cores indicated gas sand at 9,037-46 ft. Casing has been perforated 9,037-45 ft. with 32 shots. Tubing has been run on packer and the well is now being swabbed. If successfully completed, this well will probably be an extension to Angie field of Washington Parish, Louisiana, and/or Sandy Hook field of Marion County, Mississippi.

The Atlantic Refining Co. 1 Grafton estate, Section 34-9n-12w, reported driller's top of Chalk at 4,956 ft. and is drilling ahead below 4,987 ft. Structurally this point is 167 ft. lower than in Premier et al. 1 McKinley, dry hole located approximately 6,300 ft. northeast of Section 26 of same township. There is a possibility that the top part of the Chalk was faulted out, but this has not been definitely determined.

MISSISSIPPI WILDCAT FAILURES

Adams County: Serio-Gulmon & Johns 1 V. T. Craig, 95-7n-2w, dry, TD 6,998 ft.

Franklin County: Gulf Refining Co. 2 N. W. McCraine, 6-4n-1e, dry, TD 6,797 ft.

ALABAMA SUCCESSFUL WILDCAT

Escambia County: Humble Oil & Refining Co. 1 A. Lister et al "B" Lse., 18-1n-9e, TD 5,938 ft., IP flowed on 12-hour test 127 bbl. oil per day, ¼-in. choke, 27.7° gravity.

South Louisiana

Operator Testing Cameron Wildcat

NEW ORLEANS.—Stanolind Oil & Gas Co. is testing 1 C. E. and E. R. Henry, wildcat in Section 29-14s-92, Cameron Parish at 11,705 ft. On latest drill-stem test, through 7-in. casing perforated from 11,234-241 ft. and packer set at 11,209 ft. wildcat flowed 43 bbl. of fluid daily; being 45 per cent basic sediment and water, and 55 per cent oil emulsion through ¼-in. by ⅛-in. chokes. Working pressure registered 3,200 psi. with gas-oil ratio 23 to 1, and 35.8° gravity. Previous test with packer at 10,620 ft., through perforations 10,722-726 ft. test flowed at rate of 30.7 bbl. of distillate plus 3,331,000 cu. ft. of gas daily with 3,800 psi. working pressure, gas-oil ratio 43,400 to 1, and 38.8° gravity.

Cities Service Oil Co. has reported running a drill-stem test on its 1 F. P. Guidry, wildcat in Terrebonne Parish, through perforations from 12,636-640 ft. with packer at 12,624 ft. Well flowed at rate of 3,270 M.c.f. of gas daily with a slight trace of distillate on ¼-in. by 13/64-in. chokes. Working pressure registered 3,800 psi. with bottom-hole flowing pressure 3,950 psi. Operator has now reperforated at 12,624-628 ft. with 24 shots for additional tests. Well has been drilled to a total depth of 12,849 ft. with 7-in. casing cemented at that point. Prior to test, operator had run electric log to 12,849 ft., recovering 8 ft. of gas sand from 12,624-632 ft. Test is located in Section 36-17s-18e.

Gulf Refining Co. 1 Martha DeRouen, Calcasieu Parish, is drilling ahead below 11,585 ft. Latest logs reported were at intervals from 11,246-316 ft. and 11,374-452. First log recovered 28 ft. of oil and gas sand with 48 ft. of oil and gas sand being recovered from the last interval. Venture is located in Section 15-11s-6w.

The Texas Co. is waiting on cement on its 1 Baist Cooperage & Lumber Co., wildcat in West Baton Rouge Parish, after cementing 7-in. casing at 10,655 ft. Operator is preparing to perforate for test, but intervals have not been announced.

Vincent & Welch have staked location for a 8,500-ft. test known as the 1 Newport Ind., Inc. Test is located in Beauregard Parish 6 miles southwest of Juanita.

The Texas Co. tested salt water at the 10,322-36-ft. interval in the 1 Elizabeth Prather in Jefferson Davis Parish. Operators squeezed perforations and plan to test another section. Salt water came from other intervals tested between 11,810 and 11,976 ft.

Atlantic Refining Co. has abandoned its 1 Central Coal & Coke Corp. in Beauregard Parish after testing some poor samples of gas and oil odors. The hole is located in Section 4-5s-9w.

SOUTH LOUISIANA WILDCAT FAILURES

Cameron Parish: N. B. Hunt 1 Lacassine Co., 9-12s-5w, dry, TD 11,515 ft.

Plaquemines Parish: Gulf Refining Co. 1 La. St. 1954, 18-s-17e, dry, TD 10,500 ft.

Gulf Refining Co. 1 La. St. 1955, 18s-18e, dry, TD 10,500 ft.

Kansas

Stafford County Wildcat Completing As Producer

M. B. ARMER is putting his 1 Walters, Stafford County wildcat, on the pump for completion following swabbing tests in which the well produced at the rate of 30 bbl. of oil per hour. Located in the SW SE SW 36-25-13, the well is approximately 3½ miles south of the Leesburgh field, nearest production. Productive zone is in the Lansing-Kansas City lime section, opposite which casing is perforated at 3,824-30 ft. Hole was drilled to 4,395 ft. in Arbuckle lime, topped at 4,295 ft., but failed to produce in that horizon.

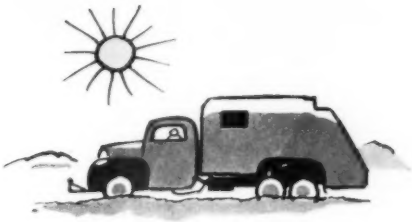
In the same county, Jackson Drilling Co. is drilling ahead to the Arbuckle in its prospective Lansing-Kansas City lime discovery well, 1 Crissman, in the NE NE SW 16-23-14. Since previously reported drill-stem tests at 3,605-29 ft. in the Lansing, topped at 3,539 ft., the well has found additional promising oil and gas showings lower in the section. Three additional drill-stem tests have been made, the first at 3,657-71 ft. getting 390 ft. of oil; the second at 3,689-3,715 ft., recovering 60 ft. of gas-cut mud with a gas flow estimated at 2,630,000 cu. ft. per day; and the third at 3,725-41 ft., getting 450 ft. of oil and 180 ft. of gassy oil. The well is more than 3 miles from nearest production.

Discovery of another Simpson sand pool is indicated in western Barber County, in the southern part of the state, where National Cooperative Refinery Association 1 Stumph-Smith, NE SW SW 7-32-14, recovered 3,625 ft. of oil during a 2-hour drill-stem test at 4,963-70 ft. Top of the Simpson had been logged at 4,961 ft. No water was indicated in the test. Flow pressure gaged 750 psi. Location is about 4 miles south of the Skinner pool, nearest production.

Continental Oil Co. has confirmed its recent oil discovery, the Feely pool, eastern Decatur County, in the extreme northern part of the state. Its 2 C. E. Feely, NW SE SW 2-5s-27w, northwest offset to its recently completed discovery well, 1 Feely, recovered load oil and then swabbed 25 bbl. of oil per hour for 18 hours after casing was perforated at 3,620-64 ft. in the Lansing-Kansas City lime section. Pumping equipment has been installed, preparatory to potential tests. Hole, drilled to 3,710 ft., was plugged back to 3,673 ft., where casing was cemented. Pay was treated with 500 gal. of acid before testing.

Nadel & Gussman also have confirmed their recent discovery, designated as the Farmer pool, in Rice County. Their 1 Matthaei, SW NW SW 19-18n-9w, east offset to the discovery well, 1 Bredfeldt, swabbed 65 bbl. in 4 hours, and now is being put on the pump for completion. Pay zone is Arbuckle lime, topped at 3,220 ft. and open below 3,222-40 ft. to bottom of the hole at 3,240 ft.

The discovery well, completed the previous week in the same pay at 3,222-28 ft., has established a pumping potential of 1,116 bbl. of



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oil following swabbing tests which produced 150 bbl. in 4 hours. A southwest offset, 2 Bredfelt, NW SE SE 24, is drilling.

KANSAS SUCCESSFUL WILDCATS

Ellis County: Shelley & Miller 1 Kansas State, SW SW 8-14s-18w, pumped 114 bbl. oil from Arbuckle 3,675-80 ft., TD 3,680 ft. (opens Experiment pool).

Rooks County: L. B. Stableford-K&E 1 Sutor, SE SW SE 5-10s-19w, pumped 80 bbl. of oil from Arbuckle 3,759-63 ft., TD 3,763 ft. (opens Lynd SW pool)

KANSAS WILDCAT FAILURES

Barton County: GMR 1 Brining, SW SE SW 31-19s-13w, dry, TD 3,517 ft.

Brooks-Hall-Murfin Drilling Co. 1 Wright, NW NW NE 33-19s-14w, dry, TD 3,545 ft.

Cowley County: Palmer 1 Williams, NE NE SW 14-30s-3e, dry, TD 3,186 ft.

Edwards County: M. B. Armer 1 Elmore,

(Continued on page 165)

Rocky Mountain

Casing Run At Little Beaver Wildcat

DENVER.—Shell Oil Co. has run casing on 1 Little Beaver, C NE SW 13-4n-61e, the southernmost wildcat along the Baker-Glendive anticline in Montana after shows of 15 per cent oil-cut mud indicated possibilities of commercial production following acidization. Tests of the wildcat are being eagerly awaited by operators in the Williston basin because of the impact a success will have in stepping up already keen activity, and movement of interest southward, and to a portion of North Dakota 150 miles south of the Beaver Lodge area of Williams County.

Shows were apparently from Madison, but no tops have yet been released by the operator. On 90-minute drill-stem test of the zone 8,462-8,524 ft. the recovery was 415 ft. of gassy, oily mud, 15 per cent oil, with flowing pressure 75-225 psi., shut in pressure 3,600 psi. Casing was landed at 8,560 ft.

The Cedar Creek area of the anticline 75 miles north of Little Beaver contains at the moment more wildcat ventures of possible major importance, all approaching critical depths at one time than has ever been the case with any one relatively limited area in the history of Rocky Mountain oil activity. The Texas Co. has an apparent discovery at the NPG 1 (NCT 8), C NE NE 7-16n-54e, 11 miles north of the Cedar Creek opener, and has two other wildcats between these two wells which have had shows which will require acidization and thorough testing for proper elevation. Hanlon Oil Co. has staked a location about 6 miles northwest of The Texas Co.'s new find, cutting down the existing gap between Cedar Creek and Richey production. The new wildcat is in C SW NW 21-18n-53e.

In North Dakota Amerada Petroleum Corp. has staked nine new locations through the general Beaver Lodge area of Williams County. One of these is a wildcat, the 1-A, North Dakota State C, C SW NW 16-158n-95w, 3½ miles west of the company's recent discovery at 1 Skaar, C NE SW 13-158n-95w.

In Wyoming, Sunray Oil Corp. has found an apparent new pay pool in the Sage Creek anticline area of Park County. Test of 8 ft. of Tensleep saturation in the 3 Fox, SW SW NE 12-57n-98w, between 3,421-31 ft. recovered 330 ft. of clean oil, and 100 ft. of heavily oil-cut mud in 1 hour. Previous production in the field has been from Madison. The field discovery was made in 1948. New locations of interest in Wyoming include Ohio Oil Co.'s long awaited location at Cedar Ridge in Carbon County. Ohio will drill a 9,500-ft. Sundance test in NW NE SW 22-22n-85w. In Natrona County Olds Oil Co. of Casper has located a wildcat just north of the city in NE NE NE 25-34n-80w, and Trigood Oil Co., also of Casper has location for a test of the Bothwell Draw area, west of Salt Creek field, in NE NE SE 6-39n-79w. Sinclair Oil & Gas Co. will drill a 10,500 ft. Tensleep test in the North Sand Draw area of Fremont County, between Pilot Butte and Winkelman fields.

In the Denver-Julesburg basin of Colorado and Nebraska two apparent discoveries have been added to a pair already testing. J. M. Huber Corp. tested oil from the "D" sand in the 1 Fite-Tener, SW SW SE 18-11n-55w, in northwestern Logan County, Colorado. Recovery on 1-hour test from 5,714-35 ft. was 335 ft. of free oil. Northwest in Kimball County, Nebraska, Gene Goff 1 Long, SW SW NW 15-12n-55w, unloaded oil from drill pipe on 1-hour test from 6,104-18 ft., with recovery of 2,380 ft. of light green oil, and 120 ft. of oil-cut fresh water. Both operators are drilling ahead below tested intervals. British-American Oil Producing Co. 1 Jacobsen, SE SW NE 27-14n-49w, an apparent "J" sand discovery swabbed oil at the rate of 16 bbl. in 24 hours, and the operator is reperforating. Ohio Oil Co. is drilling plug at 1 Preble, SE NE SE 25-15n-49w, Cheyenne County, Nebraska. The wildcat showed oil from the "D" sand on drill-stem tests.

COLORADO WILDCAT FAILURES

Logan County: L. W. Davenport 1 Denson, SE SE SW 14-7n-49w, dry, TD 4,673 ft. Morrison 4,665 ft.

Moffat County: Lusk Royalty and George Goff 1 Unit, NE NW SW 23-9n-100w, dry, TD 1,821 ft. Park City 1,673 ft.

Washington County: R. A. Goodall and Al Ward 1 State, NW NW NE 36-1s-54w, dry, TD 5,128 ft. Lakota 5,080 ft.

WYOMING SUCCESSFUL WILDCAT

Johnson County, Sussex: Continental Oil Co. 94 Unit, SW SE NW 23-42n-78w, flowed 282 bbl. oil per day through ⅜-in. choke, TD 9,785 ft. PBTD 8,985 ft. Tensleep 8,747 ft.

WYOMING WILDCAT FAILURES

Converse County, Werner Unit: Phillips Petroleum 1 Unit, C SE NE 20-37n-75w, dry, D 13,146 ft. Lakota 13,102 ft.

Hot Springs County, Big Horn Prospect: British-American Oil Producing Co. 1 Nielson, SE SW SE 5-44n-94w, dry, TD 3,436 ft. Tensleep 3,321 ft.

Washakie County, South Nowood: Gulf Oil Corp. 1 Mills-Federal, NW SW NW 31-48n-89w, dry, TD 2,721 ft. Madison 2,509 ft.

MONTANA WILDCAT FAILURES

Blaine County, Bowes: Northern Pump Co. 1 Olsen, NE NE NW 25-31n-17e, dry, TD 4,121 ft. Madison 4,106 ft.

Chinook: The Texas Co. 1 Government, C NE SE 8-34n-21e, suspended indefinitely, TD 4,431 ft. Madison 4,412 ft.

Musselshell County, Crooked Creek: Cities Service 1 Nelson, C NE NW 25-5n-24e, dry, TD 7,182 ft. Madison 8,962 ft.

UTAH WILDCAT FAILURES

Garfield County, Johns Valley: The California Co. 2 Unit, NW SW NE 22-35s-2w (SLM), dry, TD 7,700 ft. Kaibab 7,320 ft.

Uintah County, Oil Springs: Continental Oil Co. 3-A Unit, NW NW NE 15-13s-24e (SLM), dry, TD 4,177 ft. Mesaverde 2,770 ft.

WESTERN NEBRASKA WILDCAT FAILURES

Box Butte County: Superior Oil Co. 51-13 Wood, NW NW NE 13-27n-51w, dry, TD 3,840 ft. Morrison 3,786 ft.

Cheyenne County: Rogers Oil Co. 1 Lippstrew, SW SW SE 24-16n-50w, dry, TD 4,811 ft. Skull Creek 4,800 ft.

Scottsbluff County, Gering area: Stanolind Oil and Gas Co. 1 M. E. Hampton, NE NW SW 31-22n-54w, dry, TD 5,000 ft. Dakota 4,955 ft.

NORTHERN NEW MEXICO WILDCAT FAILURE

Rio Arriba County: Lowry et al 1 Morton, NE NE SE 24-24n-5e, dry, TD 2,160 ft.

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Central Area

ILLINOIS

Noah Petroleum Co. has uncovered what appears to be another Hardinsburg sand producing area at its 1 Harrell, NW NW NE 14-6s-8e, 2 miles northeast of Norris City, White County. Drilled to 2,625 ft. in the prospective pay with saturation logged from 2,614 ft., the well filled 360 ft. with clean oil during a 2-hour drill-stem test. No water was indicated. In the test, gas was at the top in 100 minutes. The location is more than a mile north of production in the Norris City area.

George & Wrather 1 Corcoran, SW SE SW 29-4s-10e, ¾ mile from production in the East Sumpter area, also in White County, swabbed at the rate of 30 bbl. of oil per day while testing Cypress sand at 2,794-2,810 ft. Previous tests in Benoist sand at 2,921-34 ft. yielded some oil with water.

Production in the newly opened Ruark West pool, Lawrence County, is being extended ½ mile to the northwest and a new pay zone opened at Walter Duncan 1 Albright, NE SW NW 12-2n13w, which swabbed 30 bbl. of oil daily while testing its prospective Paint Creek sand pay zone at 2,230-44 ft. in open hole at 2,224-53 ft. Paint Creek sand is a new pay for the immediate area. The discovery well, Coy Oil Co. 1 Prout, completed last month, produces from the O'Hara and McClosky zones.

INDIANA

A new Cypress sand discovery appears to have been made in Gibson County, where Slagter Producing Co. got 490 ft. of clean oil and 10 ft. of mud-cut oil in a 2-hour drill-stem test at 1,636-61 ft. in its 1 Richard Leffler, SE NE SE 25-3s-10w. Location is 4 miles northwest of Elberfeld.

EASTERN KENTUCKY

Northwest of the Mine Fork dome production in Magoffin County, several light wells have recently been completed as extensions to the Mine Fork pool. Dr. E. T. Arnett completed 1 Harve Issac for 3 bbl. of oil daily from Weir sand at a total depth while W. A. Willis finished 2 Ernie Howard for 4 bbl. oil daily from Weir at 903 ft. Both wells are located on Flat Fork.

In Pilot pool of Powell County Albert Dodge et al failed to find production in 37 J. B. White heirs and are converting same to a pressure well.

MICHIGAN

A Traverse oil pay was logged in Cranberry Lake field, Winterfield Township, Clare County, at John Neyer 1 State-Winterfield, NW NE NE 12-20n-6w, and on initial test well flowed an estimated 100 bbl. of oil to tanks through an open 7-in. hole in about 12 hours. Traverse lime was logged at 3,099 ft. First gas showed at 3,100-07 ft. No increases were noted until hole had been drilled to 3,114 ft., present depth, where well filled and flowed oil to pits in just over 8 hours. The 1 State-Winterfield is located just 990 ft. east of the only Dundee producer in the pool, Louis Rose 1 Tope, and this potential new Traverse well, which appears to be scheduled for completion as a commercial producer, is the second well in the area to show for success in this horizon. There are 2 deeper Richfield oil producers in this same pool.

ILLINOIS WILDCAT FAILURES

Clay County: J. G. Brown 1 Jennings, NW SW SW 4-2n-7e, dry, TD 3,119 ft.

Douglas County: Harry R. Lippit 1 Green-Martin, CNL NW NW NE 17-14n-10e, dry, TD 1,078 ft.

Edgar County: James Ruston 1 Greenwalt, E½ NW SW 30-16n-11w, dry, TD 1,657 ft.

Effingham County: George & Wrather 1 Gibson, NW NW NE 21-6n-5e, dry, TD 2,577 ft.

Hancock County: Edgar White 1 Evans, NE NE SW 25-4n-5w, 4th P.M., dry, TD 730 ft.

Jasper County: Bell Brothers 1 Harding, 330 ft. from S and W lines Fractional Section 7-5n-11e, dry, TD 2,999 ft.

Lawrence County: Norman Appleby 1 Brown, SE NE SW 14-3n-13w, dry, TD 2,100 ft.

Big Four Oil & Gas Co. and Hayes Drilling Co. 1 Heath, E½ SE NE 4-3n-13w, dry, TD 2,425 ft.

Macoupin County: H. E. Livermore 1 Hudson, NW SE SW 12-8n-8w, dry, TD 510 ft.

McDonough County: A. J. Holderman 1 Blythe, NW NW NW 22-4n-4w, 4th P.M., dry, TD 640 ft.

A. J. Holderman 1 Williams, SW SW NW 10-4n-4w, 4th P.M., dry, TD 486 ft.

A. J. Holderman 1 Jones, NW NW SW 35-5n-4w, 4th P.M., dry, TD 725 ft.

Madison County: S. T. Lalor 1 Sievers, NW SW NW 35-6n-7w, dry, TD 560 ft.

California Co. 1 Armin Kurz, SW SE SE 1-3n-6w, dry, TD 2,655 ft.

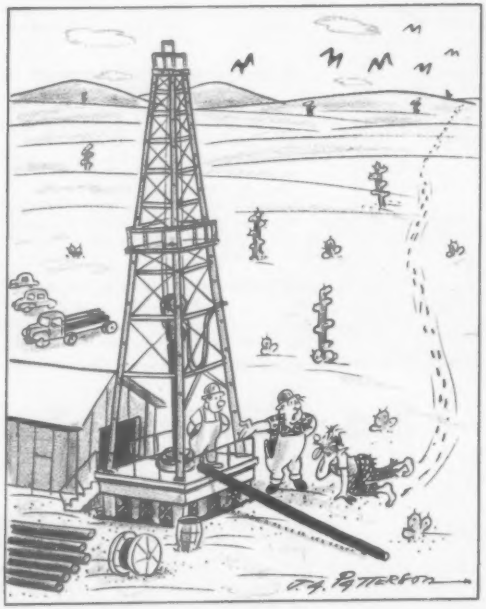
C. E. Brady and A. G. Kelly 1 McCrary, NW NW SE 24-1n-1e, dry, TD 842 ft.

INDIANA WILDCAT FAILURES

Gibson County: Sanders & Fye 1 Weber, NE SE NW 12-3s-10w, dry, TD 2,062 ft.

Skiles Oil Corp. 1 Mauck et al, SE SE SE 33-1s-11w, dry, TD 2,311 ft.

(Continued on page 165)



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May Footage Hits All-Time Record

by John C. McCaslin

MAY set a record for 1952 with completions in the United States totaling 4,164, the highest number since August 1951. Total footage drilled was an all-time record for any one month. The number of oil wells completed was the highest since August 1951.

Cumulative totals for the first 5 months of 1952 show an increase of 2,379 wells, or 14 per cent, over 1951. Oil-well completions for the period show an increase of 1,204 wells, or 13 per cent. Gas-well completions increased by 197, or 18 per cent, while dry holes showed an increase of 978, or 15 per cent. Cumulative footage drilled for 1952, the highest in the books, is 14,362,331 ft. over last year, or about 22 per cent.

Cumulative totals in the Rocky Mountain states show an increase of 311 wells of all classes over last year, or 46 per cent. Completions in the area from January-May 1952 total 985. Cumulative footage drilled in the area is up 1,986,408 ft., or 64 per cent. Colorado reported 15 new discoveries, while Wyoming recorded 13.

Texas reported an increase in cumulative total completions, up 861 or 13 per cent. Cumulative footage drilled was 37,450,233 ft., up 22 per cent. The state chalked up 436 discoveries from January - May. Oklahoma cumulative total completions were up 254 or 11 per cent, while cumulative footage totaled 9,685,530 ft., up 15 per cent. The state reported 57 new discoveries. Cumulative total completions in Kansas were up 299 or 17 per cent, while footage drilled for the period totaled 6,872-502 ft., or up 18 per cent. New discoveries totaled 47.

Cumulative completions in Louisiana totaled 949, up 141 or 17 per cent, while footage totaled 8,500,199 ft., or up 20 per cent. Wildcat strikes totaled 31. California showed an increase of 157 completions, or 18 per cent higher, while cumulative total footage was 4,327,184 ft., or up 20 per cent. New discoveries totaled 38.

North Dakota has had 17 completions this year, 13 of them for oil. Total footage drilled is 163,976 ft. Pennsylvania completions were up 165, or 31 per cent to a total of 698, while footage through May totaled 1,350,996 ft. or up 44 per cent. Illinois showed a loss of 77 wells and 220,728 ft. from last year's figures.

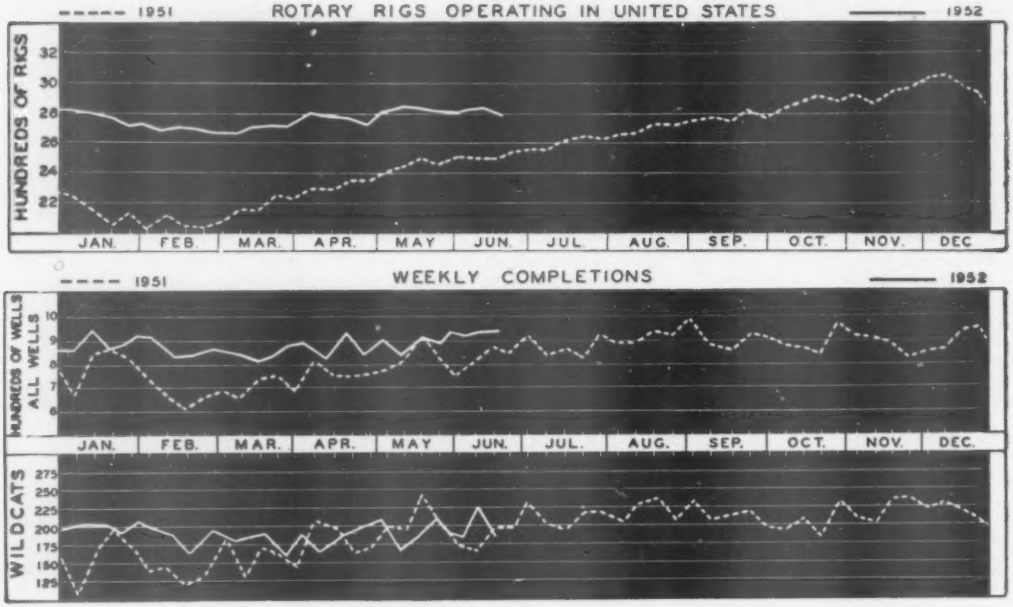
SUMMARY OF COMPLETIONS, MAY 1952

	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	58	30	0	28	58	0	0	0	0	0	83,800	65
Pennsylvania	167	82	15	70	150	17	0	0	0	0	295,600	175
West Virginia	47	4	36	7	15	29	3	0	0	0	151,622	222
Maryland	3	0	2	1	0	3	0	0	0	0	10,243	25
Ohio	94	32	29	33	51	42	1	0	0	0	196,403	156
Kentucky	151	49	24	78	100	51	0	0	0	0	299,785	91
Illinois	187	69	0	118	83	104	0	0	0	0	445,098	265
Indiana	119	43	0	76	98	21	0	0	0	0	215,594	173
Michigan	64	28	1	35	35	27	2	0	0	0	169,394	106
Kansas	437	209	35	193	53	374	10	0	0	0	1,464,462	515
Nebraska	23	10	2	11	0	17	6	0	0	0	99,539	24
Oklahoma	533	304	16	213	124	265	101	28	12	3	2,160,416	860
Texas	1,532	896	83	553	317	508	437	222	45	3	7,560,149	1,616
N. Central (Dist. 7-B & 9)	458	238	8	212	185	211	62	0	0	0	1,458,595	381
West (Dist. 7-C & 8)	433	334	3	96	36	96	202	84	13	2	2,587,344	534
Panhandle (Dist. 10)	50	25	19	6	7	39	1	3	0	0	167,090	100
East (Dist. 5 & 6)	75	37	7	31	3	28	26	18	0	0	433,810	104
Gulf Coast (Dist. 2 & 3)	291	150	34	107	32	69	77	86	26	1	1,849,495	274
Southwest (Dist. 1 & 4)	225	112	12	101	54	65	69	31	6	0	1,063,815	223
Louisiana	215	116	19	80	44	34	23	50	47	17	1,567,073	256
North	103	48	10	45	44	33	15	8	3	0	382,076	109
South	112	68	9	35	0	1	8	42	44	17	1,184,997	147
Arkansas	34	18	0	16	7	23	2	2	0	0	120,199	36
Mississippi	25	6	0	19	0	0	15	8	2	0	218,927	34
Ala., Ga., Fla.	8	2	0	6	2	0	6	0	0	0	41,668	6
Montana	40	21	2	17	25	13	1	1	0	0	107,536	88
Wyoming	76	49	1	26	11	35	25	4	0	1	345,425	166
Colorado	38	12	2	24	2	8	25	3	0	0	212,304	65
Utah	1	0	0	1	0	1	0	0	0	0	4,170	42
New Mexico	95	59	15	21	13	36	10	23	8	5	555,561	216
California	206	148	2	56	71	75	38	13	8	1	857,646	282
North Dakota	10	9	0	1	0	0	0	6	2	2	104,369	22
Miscellaneous	§1	0	0	1	1	0	0	0	0	0	1,760	¶15
Total May 1952	4,164	†2,196	284	*1,684	1,260	1,683	705	360	124	32	17,288,743	‡5,521
Total April 1952	3,821	2,063	235	1,523	1,157	1,485	735*	316	96	32	15,832,774	5,337
Total May 1951	3,921	2,058	258	1,605	1,274	1,661	615	244	105	22	15,236,578	5,493
Cumulative 1952	19,385	10,440	1,319	7,626	5,787	7,815	3,582	1,489	576	136	80,353,794	
Cumulative 1951	17,006	9,236	1,122	6,648	5,515	7,189	2,776	990	458	78	65,991,463	
Alberta, Canada:												
May 1952	128	79	11	38	17	46	62	2	1	0	556,316	
April 1952	128	80	12	36	8	48	72	0	0	0	586,718	
Cumulative 1952	603	363	43	197	85	223	281	11	3	0	2,633,025	

*Incl. 126 service wells: N. Y. 28, Pa. 61, Ohio 8, Mich. 10, Kans. 3, Okla. 8, N. Cent. Tex. 4, E. Tex. 1, S.W. Tex. 2, N. La. 1. †Incl. 35 condensate wells: Okla. 6, W. Tex. 1, E. Tex. 4, Tex. Gulf Coast 9, S.W. Tex. 3, S. La. 11, Calif. 1. ‡Incl. all wells rigged up and/or drilling at month end. §Incl. 1 Mo., 1,760 ft. ¶Incl. Mo. 5, S. D. 6, Ariz-Idaho-Nev. 4.

CURRENT STATISTICS

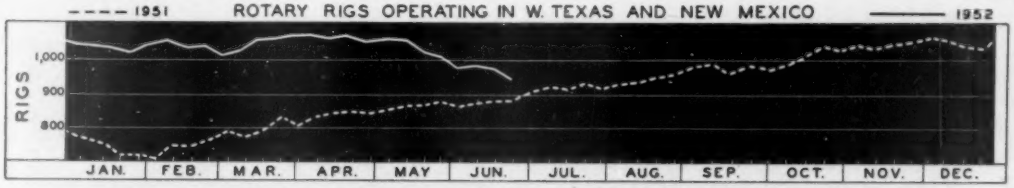
EXPLORATION

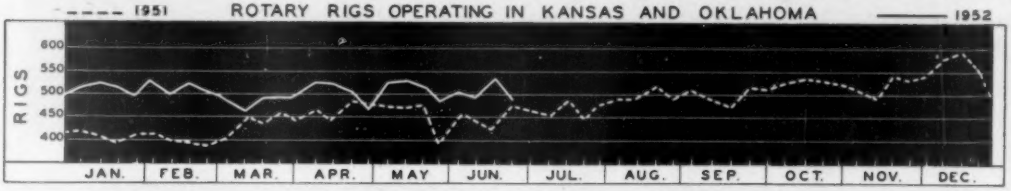


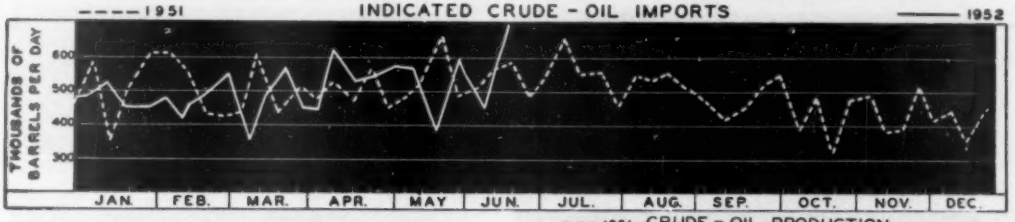
WEEKLY WELL COMPLETIONS . . . WEEK ENDED JUNE 21, 1952

	Total of all wells					June 21		Wildcat completions and discoveries					Cumulative total, 1952				
	Comp.	Oil	Gas	Dry	Footage	1952	1951	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	15	8	0	*7	20,000	336	264	0	0	0	0	0	0	0	0	0	0
Pennsylvania	41	20	4	†17	73,000	808	683	0	0	0	0	0	0	0	0	2	2
West Virginia	8	0	6	2	20,762	305	270	0	0	0	0	0	0	0	2	3	5
Ohio	25	13	8	4	62,775	456	403	0	0	0	0	0	0	0	7	7	14
Indiana	24	9	0	15	43,482	533	488	0	0	0	5	5	17	0	2	154	173
Kentucky	27	4	7	16	51,710	615	498	0	0	0	6	6	10	0	0	109	119
Illinois	47	14	0	33	105,255	760	1,014	0	0	0	16	16	7	0	0	214	221
Michigan	18	5	2	11	31,842	330	321	0	0	0	8	8	14	0	2	115	131
Kansas	134	79	8	‡47	463,460	2,289	2,002	2	0	0	17	19	47	0	7	368	422
Nebraska	7	2	0	5	37,315	113	117	0	0	0	3	3	4	0	0	61	65
Oklahoma	141	86	6	‡49	494,030	2,868	2,632	3	0	0	10	13	55	2	7	291	355
Texas	300	187	12	101	1,504,478	8,551	7,728	13	0	2	61	76	386	32	57	1,800	2,275
N. Central (Dist. 7-B & 9)	102	59	1	§42	350,536	2,673	2,383	7	0	0	24	31	217	1	20	746	984
West (Dist. 7-C & 8)	82	63	0	19	542,442	2,668	2,313	3	0	0	14	17	73	0	3	321	397
Panhandle (Dist. 10)	8	5	3	0	26,208	309	328	0	0	0	0	0	1	0	3	22	26
Eastern (Dist. 5 & 6)	27	12	1	§14	151,593	450	576	1	0	1	6	8	15	3	1	101	120
Gulf Coast (Dist. 2 & 3)	33	24	2	7	216,884	1,265	1,071	0	0	1	5	6	46	19	14	263	342
Southwest (Dist. 1 & 4)	48	24	5	19	216,815	1,186	1,057	2	0	0	12	14	34	9	16	347	406
Louisiana	37	19	4	14	275,823	1,060	951	1	0	0	6	7	20	11	5	123	159
Northern	20	10	3	7	105,332	564	482	1	0	0	3	4	8	0	5	55	68
Southern	17	9	1	7	170,491	496	469	0	0	0	3	3	12	11	0	68	91
Arkansas	11	3	0	8	48,843	179	175	0	0	0	4	4	4	0	0	30	34
Mississippi	6	2	0	4	39,405	171	140	0	0	0	2	2	8	1	1	69	79
Southeastern States	1	1	0	0	5,938	26	29	0	0	0	0	0	1	0	1	14	16
Montana	4	1	0	3	17,307	115	89	0	0	0	3	3	2	0	1	25	28
Wyoming	20	13	0	7	117,200	325	297	1	0	0	3	4	14	0	2	49	65
Colorado-Utah	8	0	0	8	41,349	230	114	0	0	0	5	5	12	0	7	84	103
New Mexico	17	11	3	3	104,020	484	308	1	0	0	2	3	20	2	1	51	74
California	46	36	0	10	225,260	1,200	1,038	0	0	0	9	9	42	0	2	233	277
North Dakota	0	0	0	0	0	18	2	0	0	0	0	0	3	0	0	4	7
Miscellaneous	0	0	0	0	0	36	35	0	0	0	0	0	0	0	10	14	24
Total United States	937	513	60	364	3,783,254	21,808	19,598	21	0	2	160	183	666	48	114	3,820	4,648
Total previous week	931	491	51	389	3,733,849	.....	.....	24	3	3	195	225	645	48	112	3,660	4,465
Total June 23, 1951	844	467	56	321	3,107,606	.....	.....	43	3	3	149	198	682	38	119	3,441	4,280

Service wells included: *7, †15, ‡4, §1.



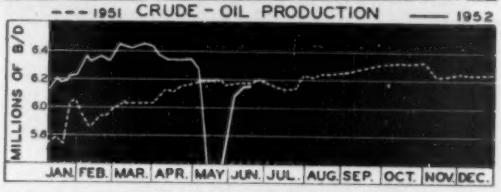


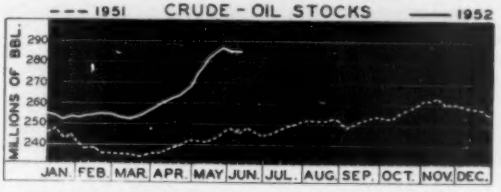


DAILY AVERAGE PRODUCTION FOR WEEK

	June 21, 1952			June 7
	Crude oil	Lease condensate	Total	total
Alabama	2,800	.....	2,800	2,650
Arkansas	75,850	4,250	80,100	80,300
California	987,800	.....	987,800	987,100
Colorado	80,400	.....	80,400	78,300
Eastern	58,800	.....	58,800	58,800
Florida	1,725	.....	1,725	1,750
Illinois	173,900	.....	173,900	166,600
Indiana	32,700	.....	32,700	32,600
Kansas	308,100	.....	308,100	311,900
Kentucky	33,700	.....	33,700	33,900
Louisiana	628,000	37,550	665,550	665,300
North	111,500	13,100	124,600	124,350
South	516,500	24,450	540,950	540,950
Michigan	34,900	.....	34,900	37,400
Mississippi	92,900	4,400	97,300	97,650
Montana	28,000	.....	28,000	27,500
Nebraska	6,600	.....	6,600	6,400
New Mexico	164,575	425	165,000	164,900
Oklahoma	510,700	.....	510,700	512,100
Texas	2,655,650	43,850	2,699,500	2,699,500
Dist. 1	31,625	125	31,750	31,750
Dist. 2	143,725	3,850	147,575	147,575
Dist. 3	437,100	25,000	462,100	462,100
Dist. 4	236,800	4,500	241,300	241,300
Dist. 5	54,075	250	54,325	54,325
Dist. 6	115,375	4,400	119,775	119,775
East Texas field	270,000	.....	270,000	270,000
Dist. 7-B	92,450	75	92,525	92,525
Dist. 7-C	132,375	5,075	137,450	137,450
Dist. 8	896,850	200	897,050	897,050
Dist. 9	162,700	375	163,075	163,075
Dist. 10	82,575	.....	82,575	82,575
Utah	4,300	.....	4,300	4,200
Wyoming	185,000	.....	185,000	185,000
North Dakota	2,800	.....	2,800	2,800
Total U. S.	6,069,200	90,475	6,159,675	6,156,650
Change from previous week, up			3,025	
Canada	222,500	.....	222,500	184,743

Cumulative figures to be resumed when complete totals for strike period are available.



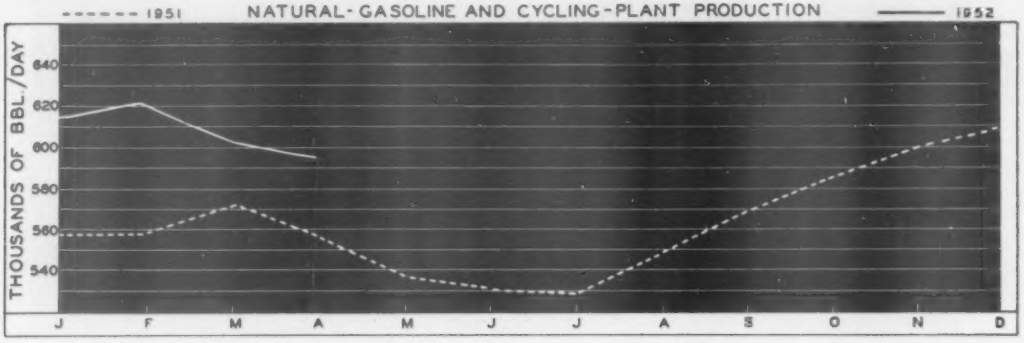


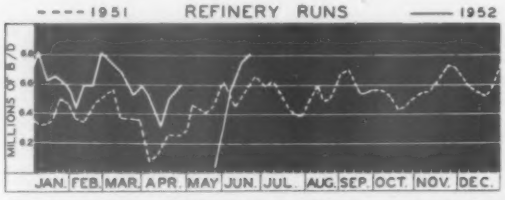
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

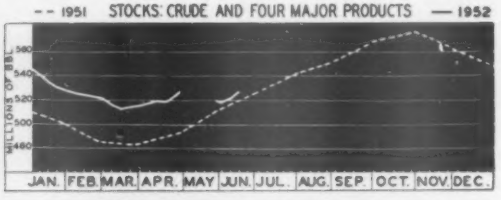
(Thousands of barrels)

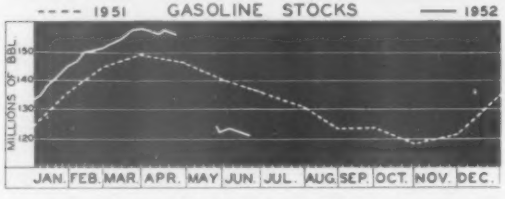
	June 14, '52	June 7, '52	June 16, '51
Pennsylvania Grade	2,564	2,519	2,115
Other Appalachian	2,090	1,993	1,539
Illinois, Indiana, Michigan	13,063	13,521	10,984
Arkansas	3,223	3,174	2,765
Louisiana	15,327	15,920	14,525
North	2,768	2,830	3,091
Gulf	12,559	13,090	11,434
Mississippi	2,959	3,422	3,200
New Mexico	7,741	7,729	6,637
Oklahoma and Kansas	42,804	43,023	38,091
Texas	141,090	140,374	115,645
East Texas proper	14,335	13,660	(†)
West Texas	60,403	60,188	(†)
Texas Gulf	31,267	32,405	(†)
Other Texas	35,085	34,121	(†)
Rocky Mountain	15,233	15,374	14,241
California	30,240	30,498	30,566
Foreign	8,572	7,389	8,258
Total	284,906	284,936	248,566

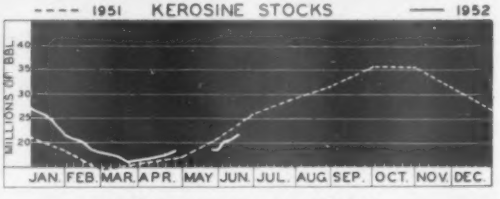
*Bureau of Mines. †Not comparable with current week.

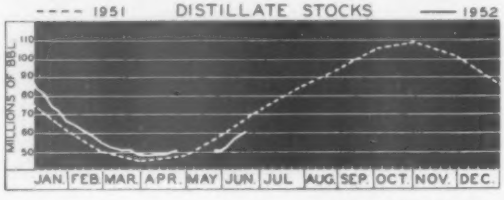


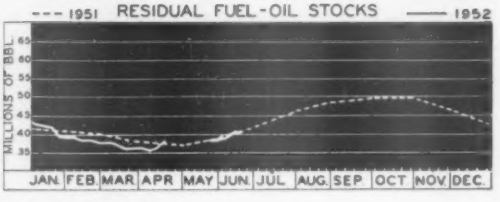










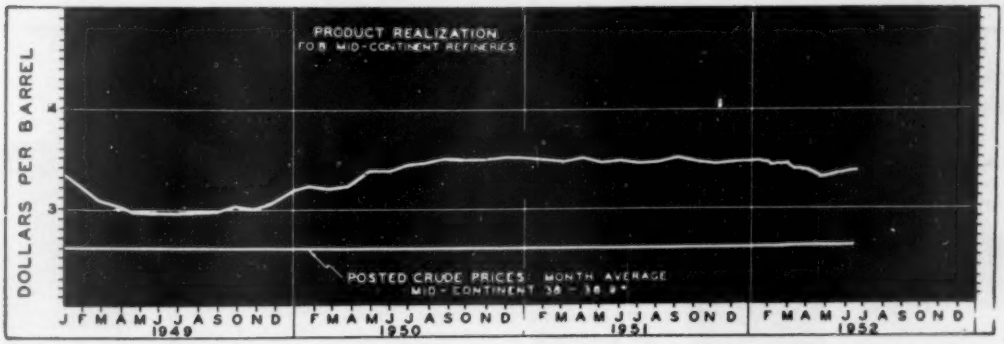


A.P.I. REFINERY REPORT, JUNE 21

(Thousands of barrels)

District—	Daily avg. runs	Daily average production— Gaso.*	Kero.	Dist.	Resid.	Stocks‡— Gaso.†	Kero.	Dist.	Resid.	Bureau of Mines, June 1951— Daily avg. runs	Daily average production— Gaso.*	Kero.	Dist.	Resid.
East Coast	1,125	411.6	44.0	240.4	233.6	28,750	9,329	18,873	11,527	1,042	404.4	45.2	225.7	242.9
Appalachian:														
District 1	107	46.4	4.3	15.4	12.0	3,585	467	890	693	106	49.9	6.5	13.3	9.6
District 2	81	41.6	2.4	17.3	12.3	1,778	227	318	252	76	36.9	4.4	8.6	17.1
Ind., Ill., Ky.	1,228	672.4	54.6	234.0	141.3	25,285	4,062	11,912	5,260	1,210	634.3	64.2	193.7	156.7
Okla., Kans., Mo.	523	291.0	15.4	114.9	58.7	11,484	1,361	8,690	1,564	546	290.0	18.6	123.7	66.7
Inland Texas	256	179.1	12.3	40.1	42.2	4,007	426	1,260	962	257	160.2	12.4	39.5	44.1
Texas Gulf Coast	1,652	727.8	120.4	465.6	277.4	17,707	3,035	6,629	6,390	1,567	707.9	113.6	330.7	248.9
La. Gulf Coast	560	241.6	38.0	141.6	52.4	6,099	1,754	2,540	1,690	500	242.3	38.8	126.4	65.2
N. La. and Ark.	79	33.6	6.7	20.9	5.7	2,746	513	1,047	223	76	29.6	6.4	17.5	7.7
Rocky Mountain:														
New Mexico	18	10.6		2.6	3.9	121		66	30	14	7.5	0.2	2.7	3.3
Other Rocky Mtn.	227	108.9	7.2	44.0	42.7	4,649	384	1,487	1,195	237	108.9	4.0	45.3	46.7
California	949	415.1	6.0	147.1	345.7	15,402	307	7,193	13,036	944	428.2	12.9	126.7	367.9
June 21, 1952	6,805	3,179.7	311.3	1,483.9	1,227.9	121,613	21,865	60,906	42,822	6,575	3,100.1	327.2	1,253.8	1,276.8
June 14, 1952	6,762	3,114.6	315.4	1,471.1	1,288.1	121,993	21,086	57,944	40,889					
June 23, 1951	6,649	3,158.1	367.1	1,258.0	1,327.9	137,036	25,758	67,181	41,586					

*Rt refineries including natural blended. †Finished and unfinished. ‡At refineries, bulk terminals, in transit and in pipe lines.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
4
3
POSTED CRUDE PRICES, MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
J F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951
F M A M J J A S O N D
1952

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.37 for week ended June 14, $3.36 for previous week, and $3.49 for June 1951. The above trend information is based on volumes and current prices and therefore does not reflect changes in operating costs.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of June 25, 1952. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10¾-10½	12.125-12.75	10¾-11
Premium gasoline, 86-88 octane	11⅜-11½	13.5-13.75	11¾-12
42-44 w.w. kerosine	8¾-9	10-10.1	9
No. 2 straw fuel oil	7¾-8	9-9.25	8
No. 6 residual	$1.00-1.30	$2.35-2.50	$1.70-1.85

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6.1	6.35

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	27-28
200 vis., No. 3 neutral, 0-10 pp.	14.5-15.5

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

Mid-Continent

132-134 A.M.P.	5.5

THE general market trend in the last week of June was toward lower prices for heavy fuel and a little more gasoline available on the open market.

In the Mid-Continent residual fuel seems to be headed toward the low level reached in 1949. The small advantage gained by lack of stock increase during the refinery strike has been offset by the loss of consumption during the steel strike that came at a time when heavy-fuel demand was seasonally low.

The soft residual market in the Group 3 area during the winter months did not reduce shipments from Mid-Continent refineries. There was a strong demand for heavy fuel on the Gulf Coast but at a ceiling price which resulted in a low netback to refiners in the interior. The problem today is not to find a market for No. 6 that will net the refiner a decent return but to find a customer—any customer.

The heavy-fuel market on the East Coast has softened with the loss of use by the steel mills and by other plants with reduced operations during the steel strike. In most cases it is not a question of customers looking for lower prices. At the present time there is just a shortage of customers.

The lack of demand on the East Coast is reflected in a weaker Gulf Coast market, and that in turn cuts down on the possibility of sales from Mid-Continent refineries for shipment to the Gulf.

Reports indicate that a buyer with shipping instructions would be swamped if he offered as much as $1.00 a barrel Group 3. There have been unconfirmed reports of shipments to the Gulf Coast that resulted in a netback of about 75 cents Group 3.

Gasoline is still very firm in all areas, but supplies are not as tight as they were a week ago. Some gasoline was reported available in the Great Lakes pipe line.

CRUDE PRICES

GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.93			
19-19.9	1.98			
20-20.9	2.03	$2.25		$2.12
21-21.9	2.07	2.27		2.14
22-22.9	2.12	2.29		2.16
23-23.9	2.18	2.31		2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.	
Kettleman Hills, California*	$2.80
Louisiana:	
Beauregard Parish	2.60
Cotton Valley (distillate)	2.85
Cotton Valley (crude)	2.70
Texas:	
East Texas	2.65
Pecos County (Yates)	2.35
Conroe	2.83
Van	2.48
Pennsylvania Grade:	
Bradford	4.25
Southwest Pennsylvania	3.82
West Virginia	3.76
Illinois Basin	2.77

*37°-37.9°.

EQUIPMENT MEN . . . in the News

General American Announces Houston and Tulsa Changes

General American Transportation Corp., plate and welding division, through H. D. Skyrm, vice president, has announced the appointment of

J. D. CAMP

J. C. WALLACE

James D. Camp as district sales manager in the Houston office. Camp, who has been transferred from the Tulsa office, will be replaced at Tulsa by James C. Wallace as sales engineer. Wallace has been moved from General American, engineering department, in Chicago. He will handle the Oklahoma-Kansas territory.

Camp was previously with General American in Chicago for approximately 4 years before transferring to Tulsa.

Lane-Wells Announces Five New Assignments

Expanding operations in two divisions have resulted in sales engineer assignments for five Lane-Wells men, company officials have announced.

Those affected by the expansion are O. T. (Tony) Bright, Leonard F. Chilton, and John S. Hatcher in the Mid-Continent division, and Tom Caton and Charles Viverette in the Gulf Coast division.

Bright began his Lane-Wells career as a rigman in 1948 and later became a radioactivity operator. His experience in this field gave him the necessary background for his new position as a district sales engineer in the Mount Carmel, Ill., area.

Leonard F. Chilton, who spent 4 of his 5 years with Lane-Wells as a combination operator in Cody, Wyo., will remain in the same office, but will now function as district sales engineer.

Seven years of service is the background John Hatcher takes to his new job. He has worked in virtually every field category and will now serve as district sales engineer with headquarters in Guymon, Okla.

Caton joined Lane-Wells as a rigman in 1946 and has worked as a hoist man and operator. Beaumont, Tex., will be Caton's headquarters in his new assignment.

Charles Viverette worked as a rigman on a Lane-Wells gun perforator following his graduation from Mississippi State University. He later became a hoistman, perforator operator, and radioactivity well logger. In his new assignment he will be sales engineer for the area around Odessa, Tex.

Sheffield Makes McAlpin District Sales Manager

J. R. McAlpin, Sheffield Steel Corp. sales executive and metallurgist, has been promoted to district sales manager in charge of the regional sales office serving Houston and the Gulf Coast area, W. S. Newall, Sheffield manager of sales, has announced.

J. R. McALPIN

McAlpin joined Sheffield in 1949. Previously, he had been with Crucible Steel at Midland, Mich., as a metallurgist and research specialist in charge of experimental work.

Iverson Adds Ferguson To Field Sales Staff

T. D. (Hi) Collins, vice president and general manager of Iverson Supply Co. of Tulsa, has announced the appointment of Laurence E. Ferguson to the field sales staff with headquarters in Tulsa.

L. E. FERGUSON

Ferguson is a graduate of University of Oklahoma, and began working in the industry in 1926 during the Seminole boom. For the past 15 years he has been identified with the sale of machinery, tubular goods, and supplies. He was formerly sales manager of Franks Manufacturing Co., and field sales manager for Wheland Co. for 4 years previous to joining Iverson.

George C. Wilder Named Macwhyte President

At a special meeting of the board of directors of Macwhyte Co., Kenosha, Wis., George C. Wilder was appointed a director to fill the unexpired term of the late Jessel S. Whyte, and was elected president of Macwhyte Co.

Wilder was vice president and assistant general manager and has served

G.S.I. Holds Second Annual Supervisory Conference

At its second annual supervisory conference held recently in Dallas, Geophysical Service, Inc., brought together 40 supervisors, division managers, and management personnel representing the various areas of G.S.I.'s operations. Twenty-one papers were presented in the 2-day session with a round-table discussion following each paper. Dr. E. E. Rosaire was guest speaker and presented "Seismic Velocity Anomalies." Pictured are, first row: Neil Mann, Robert F. Dundon, John Imle, J. V. McManus, W. C. Edwards, Jr., Cecil H. Green, J. W. Thomas, B. F. Smith, H. B. Peacock, C. M. Moore, Jr., and W. T. Hudson. Second row: T. P. Ellsworth, K. E. Burg, M. E. Trostle, C. H. Elston, D. W. Rockwell, R. H. Rainey, P. V. Hodge, G. J. Kohler, Earl Thomas, B. A. Harris, and J. W. Gary. Third row: Robert Dyk, R. D. Everett, V. W. Teufel, R. H. Wright, F. J. Agnich, T. A. Halbrook, J. L. Stephens, F. E. Romberg, R. C. Dunlap, Jr., E. J. Stulken, Clark Allen, and E. A. Kiesler.

in various capacities since joining the company in 1938 after receiving a B.A. degree from Cornell University.

Other officials of Macwhyte are: R. P. Tyler, vice president in charge of sales; R. B. Whyte, vice president in charge of operations; H. E. Sawyer, vice president and treasurer.

Resiner Made Manager of Steel and Tube Division

W. J. RESINER

Appointment of W. J. Resiner as manager of stainless - steel - tubing sales of the steel and tubes division of Republic Steel Corp. has been announced by J. A. Ireland, general manager of sales, sheet and tubes division.

Resiner was formerly sales engineer, holding that position since he joined Republic in January 1942. For the past year and a half he has been on leave from Republic to work with the National Production Authority. Recently he has been chief of the tube section in Washington.

Resiner is a graduate of Purdue University with a master's degree in chemical engineering.

Midwest Piping Builds Large Plant Addition

Recently completed addition almost doubles capacity of welding fittings manufacturing plant of Midwest Piping & Supply Co., Inc., St. Louis. Photo shows addition only; original plant at right beyond picture.

Midwest Piping & Supply Co., Inc., St. Louis, has just completed a large addition to the welding fittings manufacturing plant, according to an announcement by Pres. A. C. Stoughton.

The new addition adds 48,000 sq. ft. of floor space and more than doubles the pressing and welding capacity.

Modern equipment for the precision manufacture of pipe welding fittings has been placed in the new addition. Equipment is now complete except for a new press capable of producing welding elbows up to 36-in. pipe diameter.

Pipe Line Service Expands Facilities at Franklin Park

A new coating-and-wrapping mill, designed specifically to handle pipe sizes up to 30 in. in diameter and 60 ft. in length, has just been completed at the main plant of Pipe Line Service Corp. at Franklin Park, Ill., according to an announcement by A. J. Duaei, president.

This new mill provides the latest facilities for protecting pipe. These facilities include such features as large ovens for drying pipe, grit cleaning machines, and thermostatically controlled melting kettles. The Franklin Park plant, with the completion of this new addition, now comprises two pipe-coating mills and a modern machine shop on 21 acres, with ample available space for the storage and handling of customers' pipe. Three switch tracks serve the two mills.

Houston Delegates Fly to San Francisco P.E.S.A. Meet

The annual Petroleum Equipment Suppliers' Association convention held in San Francisco last week drew equipment men and manufacturers from all over the country. Part of the delegation from Houston made the trip in the Mission Manufacturing Co. plane. They are: T. W. Adair, pilot; Lee Roy Thurman, copilot; M. E. Montrose, vice president in charge of sales, Hughes Tool Co.; Harry Catlow, vice president in charge of sales, Republic Supply Co.; Mrs. H. Joseph Chase; H. Joseph Chase; Mrs. Catlow; W. T. Campbell, executive vice president of Mission Manufacturing Co.; Mrs. W. D. Wilson; W. D. Wilson, president of Wilson Supply Co.; Mrs. George O'Leary; George O'Leary, president of Houston Oilfield Material Co.; Mrs. Montrose, and Mrs. Campbell.

Graver Water Conditioning Advances Fosnot, Limon

H. R. FOSNOT

Graver Water Conditioning Co., manufacturers of equipment for all water-conditioning processes, has announced the appointment of Harold R. Fosnot as assistant general sales manager, and Leonard Limon as manager, sales engineering department.

Fosnot holds the degrees of B.S.M.E. from Purdue University and M.B.A. from University of Chicago. He came to Graver in 1935 and later was employed as district manager in the sale of Graver fabricated steel and water-conditioning equipment. In 1951 he was made eastern district sales manager, with headquarters in New York, and held that position until he was ad-

vanced to assistant general sales manager.

Limon holds the degrees of B.Ch.E. from City College of New York and M.Ch.E. from New York University. Before coming to Graver in 1949, he had experience as executive in charge of the design, estimating, and pricing of all types of water conditioning equipment.

Shuman Tours South America For Fluid Packed Pump

Sid Shuman, general sales manager, Fluid Packed Pump Co. recently returned from a 3-month trip throughout South America where he visited Argentina, Chile, Peru, and Venezuela. He spent considerable time in eastern and western Venezuela where National Supply Co. of Venezuela maintains extensive shops for servicing Oilmaster Downwell pumps.

Cummins Diesel Names Lawrence Vice President

W. B. Lawrence, for the past year and a half general manager, Cummins Diesel Sales Corp. with headquarters at Columbus, Ind., was elected a vice president of the corporation at a recent meeting of the corporation's board of directors.

Lawrence joined the Cummins organization in 1948 as the Rocky Mountain regional manager in Denver. He continues to serve as general manager of the eight Cummins dealerships operated by the sales corporation.

Livingston Made Assistant To McKee President

Announcement has been made by H. E. Widdell, president of Arthur G. McKee & Co., Cleveland, of the appointment of Myran J. Livingston as assistant to the president. In his new position Livingston is to assist in directing the activities of the company's petroleum-refining division. For the past several years Livingston has been sales manager of the company's petroleum-refining division, and prior to that he had been in charge of the company's sales office in New York.

Taylor-Jackson Firm Established in Shreveport

S. D. Jackson has announced the formation of the firm of Taylor-Jackson Machinery Co. in Shreveport.

Principal line of the new firm will be packaged gas-compressor units, assembled and fabricated in Shreveport, backed up with a general line of oilfield and pipe-line machinery and specialties. Taylor was formerly purchasing agent for Interstate Oil Pipe Line Co. at Shreveport.

Jackson has been in the machinery business for 30 years, and was purchasing agent for a major company.

National Tank Holds Annual Sales Conference

Attending the June 6 and 7 meeting were, back row: Earl Keck, Marvin Willis, H. D. Jones, Joe Wells, Tracy Smith, Bill Wallace, Ed Fontaine, Floyd Senter, Chester Immel, Les Lamb, Ed de Young, Lynn Burrus, Don Boling, Rex Williams, and Bill Dunn. Middle row: Sam Mays, Herb Walker, Bill Willis, Charles Purser, Bill Little, George Steinhaus, Joe Marshall, Reed Speir, L. M. Jewett, Red Brinkley, Bill Bechtold, Bill Becker, Ward Guin, and Sherman Barclay. Front row: Merle Bryan, A. H. Vanderlee, Jim Brown, Neely Lowrie, Clem Kler, Lloyd Conley, George Powers, Dud Lowrie, Jack Williams, and Johnny Shelton.

Attending the May 23 and 24 meeting were, standing: Jim Tallant, Paul Meyers, T. R. Hoffman, T. R. Graham, Jay Stafford, Dick Brooks, Bill Addison, Paul Hughes, Louie Edmonson, Cliff Hill, J. D. Thomas, Warren Gray, C. W. Gilbert, M. T. Harrison, Rex Meyers, Bill Wilson, Herb Hudson, E. J. Perero, J. S. Chism, Harry Mitchell, Joe Notley, Bill Kidder, H. C. Butler, Rex Ricketts, and Marvin Whited. Kneeling: Leo Barbee, Joe Green, Bill Akin, Ralph Delashaw, Don Standley, Russel Morris, B. L. Nugent, R. J. Bourgeois, O. A. Claunch, Elvis Guin, Paul Jake Myers, John Swiney, Johnny Powers, and Everett Miller.

The field sales, branch, and district managers and service personnel of National Tank Co. have just completed their annual sales conference. Divided into two separate meetings, representatives from National's 41 domestic and Canadian branches participated in the meeting. Conducting the meetings were Jay P. Walker, National president; Cecil Wells, executive vice president, and Clarence Glascow, vice president and chief engineer.

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PIPE

All sizes; line pipe and casing, tanks, and Oilfield supplies. Edco Pipe & Supply Co., Phone 45970, P.O. Box 151, Tulsa, Oklahoma.

FOR SALE: Good 3½" and 4½" OD Drill pipe. Two EKU Waukesha's, One RL Cardwell, Hercules Engine, Tanks, Treaters, Pumping units. Rogers Pipe & Supply Co., 620 Wright Bldg., Tulsa, Oklahoma.

TWO O C S Duck, One C D 70 Emsco pumping units complete with 15 HP Electric motors, Allen-Bradley controls all in good condition. 3700 feet 3" 9.3 lb. EUE tubing, 2500 feet 3" regular tubing, 6000 feet ⅞" sucker rods, 2500 feet 3" line pipe. All good material, Lease being abandoned. 2800 feet 8⅝" casing to be pulled. A. M. Moore, McCamey, Texas. Phone 46.

NEW FRACTIONATING TOWER

One (1) New fractionating tower, 5' 0" I.D. x 89' 6" over-all height x 1⅛" plate. Thirty-four (34) bubble trays, ten (10) 18" 300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure. Located Watt Metal and Boiler Works, Houston Shops.

ROCK ISLAND OIL & REFINING CO., INC.
321 W. Douglas Wichita, Kansas
Phone 5-5674

STEEL STORAGE TANKS

11—55,000 bbl. Tanks—114' 6" dia. x 30' high
10—80,000 bbl. Tanks—117' 6" dia. x 41' high

All tanks steel roof, riveted construction throughout. Standing location near Mexia, Texas, and suitable for re-erection. Detailed specs. and prices available on request.

SOUTHERN IRON & METAL CO.
Box 3270, Beaumont, Texas

MID-STATES PIPE & SUPPLY CO.
Box 2534, Tulsa, Okla.

ROGERS & WRIGHT, INC.
215 Wright Bldg., Tulsa, Okla.

HORWITZ PIPE & STEEL CO.
Box 1466, Oklahoma City, Okla.

TANKS FOR SALE

Good as new, for immediate delivery. One 80,000 BBL. Seven Ring all steel tank for $25,000.00. Three 55,000 BBL. Five Ring all steel tanks for $17,500.00 each. As is where is and subject to prior sale. We will also cut down and re-erect as welded tanks either of the 55,000 BBL. tanks above for $38,500.00. Or we will cut down and re-erect the 80,000 BBL. as a welded tank for $30,250.00. These are rivited tanks and of standard construction and may be inspected now near Shreveport, La. Contact by mail or phone

We will trade any of the above tanks for Scrap iron.

CLYDE DAMPF, INC.
Box 2515, Amarillo, Texas. Phone 3-5030

EQUIPMENT FOR SALE

for
VALVES • FLANGES • FITTINGS
it's
Newman's Inc.
"One of the Southwest's Leading Distributors"
Tulsa, Okla. P.O. Box 1865 Ph. 25228-LD 635

2—WORTHINGTON Type 4HR5 Pumps
Capacity 1000 GPM; 625 ft. Head driven by 200 HP. "General Electric" AC Motor 3/60/2300 V — 3500 RPM. Attractively priced.

J. A. DOUGHERTY
P.O. Box 90 Bala-Cynwyd, Pa.

EQUIPMENT FOR SALE

NEED a good 4500 foot draw works? Wilson Giant, Vacuum controlled, GM 12103 Twin Six Diesel, Pump drive, Friction catheads. Excellent running condition. Located Great Bend, Kansas. C. Spitzfaden, Box 2001, Wichita, Kansas. L. D. 128.

FOR SALE: 40 HP. Lufkin Cooper-Bessemer Diesel Type GSDH with clutch, oil pump, radiator, Maxim silencer; used 15 hours. Lloyd-Smith Company, Inc., Bradford, Pa.

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

NATURAL GAS ENGINES——GENERATORS

Three Minneapolis-Moline Natural Gas Engines, 225 H.P. 650 R.P.M., 8"x9", 6 cyl. Type NE.
One 152 KW, Allis-Chalmers Generator, 3 ph., 60 cyl, 220 volts, 900 R.P.M.
One 180 KW, General Electric Generator, 3 ph., 60 cyl, 220 volts, 770 R.P.M. Type ATE-10-225 M, Form P.B.

Note: Generators are connected to two of above engines, sheave and V-belt drive.

Units Completely Reconditioned

REFINERY & GASOLINE PLANT EQUIPMENT, INC.
1705 West Gray P. O. Box 13203
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PIPE FOR SALE

40,000'—3½" O.D. Standard 7.6# used line pipe—T & C.
20,000'—3½" O.D. Standard 7.6# used line pipe—P.E. Torch Cut.

Above pipe has all been machine cleaned, straigtened and is in sound condition. Available for immediate shipment.

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PRESSURE VESSELS * AIR RECEIVERS * TANKS * KELLOGG FURNACES PIPE * VALVES & FITTINGS * STEAM PUMPS * CENTRIFUGAL PUMPS HOT OIL PUMPS * ELECTRIC MOTORS * HEAT EXCHANGERS * STACKS AGITATORS * INSTRUMENTS * AIR COMPRESSORS

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All items priced attractively for quick sale as must vacate premises.

DALLAS REFINERY PROJECT
Box 5624 Phone Federal 6566 Dallas, Texas

FOR SALE: One 36-L Bucyrus-Erie drilling machine, complete with tools. Also 1,942 ft., new 7 inch, 17 lb., H-40, range 2, seamless casing and 2,409 ft. of new 2⅜ inch, 4.60 lb., range 2, J-55, seamless regular tubing. Box E-812, The Oil and Gas Journal, Tulsa, Oklahoma.

NEW IMPORTED SEAMLESS J-55

Regular monthly shipments Prime, API, 5½" OD and 7" OD casing, Hunt or Moody inspection. Performance bond furnished guaranteeing shipment.

BARON TUBE COMPANY

722 Oliver St. N. W., Atlanta, Ga.
Importers of Casing & Tubing.
Phone Atwood 9721-2

FOR SALE

1. Franks Model SAL 5000 Rotary Rig, and sub-structure complete, in good condition, equipped with 3 new gas engines, including 5500 ft., 4½-in. drill stem, 3 Oilfield trucks and 2 trailers. Immediate possession, including drilling contract if desired. TERMS. Also have Oil leases in Colo., Wyo., & Nebr., for sale or farm-outs and some royalty in Colo., and Nebr.

Phone or write

SUHR, FIELDER, LOCK DRILLING CO.
Holyoke, Colo.

2—6 Cyl. CUMMINS Model H1 Diesel Generator Units, 90 HP, directly connected to 25 KW 31.2 KVA Generators, 3/60/120/208 volts, 4 wire. Price $2500.00 each. Actual use 60 hours.

1—SHEPPARD Brand New, Never Used, Late Model Diesel 3½ HP with 2 KW Generator, 115 volt, 60 cy. single phase. Model 14 Air Cooled Engine directly connected to Leland Generator. Perfect Condition. Price $875.00.

1—SHEPPARD Brand New, Never Used, Late Model Diesel 3½ HP Model 14 Air Cooled Power Unit. Mounted on 2 wheel rubber tired dolly. Lever clutch attachment. Perfect condition. Price $456.00.

General Machinery & Equipment Company

140-44 S. 17th ST.

HARRISBURG, PA.

EQUIPMENT FOR SALE

AVAILABLE for immediate delivery TWO MOBILE REPAIR SHOPS designed to provide mobile facilities for maintenance and repair of vehicles, construction and industrial equipment; test used only, equal to new. Write for further particulars; $30,000 each f.o.b Los Angeles. EXPORT TRADING CO., 1921½ Talmadge Ave., Los Angeles 27, Calif.

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WELL DRILLING MUD BLENDERS
We manufacture sodium humate type material, a good dispersing agent for drilling muds. Can be used alone or in combination with other drilling compounds. Write for prices and information.

American Lignite Products Co.
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FOR SALE

Franks Model S.A. 4500 Rotary Rig, now in operation, with two newly rebuilt Cummins Diesel engines, and 4500 feet of 4½ inch drill pipe.

SHELLEY-MILLER DRILLING, INC.
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FOR SALE—GAS ENGINES AND GAS COMPRESSOR CYLINDERS

1—200 H.P. Clark Twin Gas Engine, 16" x 20" Power Cylinder
1—165 H.P. Bessemer Twin Gas Engine, 17" x 20" Power Cylinder
2—80 H.P. Clark Single Gas Engines, 16" x 20" Power Cylinders
1—26" x 20" Compressor Cylinder
1—24" x 20" Compressor Cylinder
2—18" x 20" Compressor Cylinder
1—16" x 20" Compressor Cylinder
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All above units are complete and in good operation condition and located in Benton, Illinois.

BROWN-STRAUSS CORPORATION
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Salesman on premises. Contact R. V. Crisp, Phone 1419 or 610, Benton, Illinois.

FOR SALE

One six-foot-diameter, forty-foot-high fractionating column with sixteen bubble trays. Also one tubular heater having 32 four-inch radiant tubes, 18 feet long, and 119 four-inch convection tubes, 10 feet 9 inches long, steel return headers. Heater is steel frame and has suspended walls and arch. Located near Cement, Oklahoma, on Frisco Railroad. Address all inquiries to R. C. Arnold,

ANDERSON-PRICHARD OIL CORPORATION
807 Liberty Bank Building,
Oklahoma City, Oklahoma

EQUIPMENT FOR SALE

FOR SALE: Unit Rig U-34 draw works with 2—145 GKU Waukesha engines and 2—10,000 series Twin Disc Torque converters; 1—7¼" X 14" Gardner Denver Pump powered with a V-12 LeRoi; 96' Lee C. Moore mast with 7' substructure. This rig is complete with drill pipe and drill collars, ready to drill, located at Hobbs, N. M. Sharp Drilling Company, Box 1271, Midland, Texas.

FOR SALE: 15000' Rig. Bethlehem MC-950 draw works; 3 engine chain compound with double pump drive; 3 LRO Waukesha engines; 1—7¾" X 18" G600 Bethlehem Pump; 1—7¼" X 16" G300 Bethlehem Pump; Lee C. Moore 136' Cantilever mast with 14' substructure; 2—12" QRC Cameron Blowout Preventors. This rig is complete with drill pipe and drill collars, ready to drill, located in Lea County, N. M. Sharp Drilling Company, Box 1271, Midland, Texas.

WILSON Giant Single Drum, Skid Mounted Unit W/Ford V-8 Engine, $2,400.00; 6" Type "A" Ideal Swivel $850.00. Both Completely Reconditioned. Lum Price, 417 East 16th, Houston. UN-8945.

FOR SALE: Pumping units—One Bethlehem 456 DO, type 20-DO, 50 HP, peak torque 250,000 lbs., 60 HP Waukesha motor. One Emsco size 112 CH, serial No. 1203, load 150,000 lbs. RPM 252,000, ratio 9.4 10 to 1, 90 HP Climax Bluestreak Engine. Both of these units are complete with belts and ready for inspection. If interested, please contact Moran Oil Company, Phone 3-3595, or P. O. Box 2686, Tulsa, Oklahoma.

FOR SALE: At Kelly, Wyoming—National Drilling Machine #3-A-6 with WOK Waukesha engine, 13" shear poles, choice and complete 18" to 7" drilling and fishing tools, 3000 gallon Butane tank, drilling and sand lines. For further details write or call Gled Oil Co., 110 Midco Building, Tulsa, Oklahoma.

10,000' 4½" API Full Hole Drill Pipe tested by Sonoscope engineers, also 1075' 6⅝" OD 26# Drill Pipe, like new. Milford Giffin, Tel. 477, Hoisington, Kansas.

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WE sell used/rebuilt Well Drilling Equipment, Bulldozers, Draglines, electric generating plants, air compressors, trenchers, railroad equipment, surplus machinery, etc. Mr. Gonzalez, Baker Export Co., Pecos, Texas.

WELL drilling equipment, new or used. Spudders, rotaries, core & shot hole drills, tools, pipe, bits, blocks, pump jacks, valves. Everything for well drilling and service. Fishing tools rented. Pressey & Son, Pueblo, Colo.

WELL SERVICING UNITS — Skid type, Single Drum Cardwells, Wilsons, Allis-Chalmers, Muskogee, Keltner. Double & Single Pole Mast. Have Draw Works on long skids w/ 86' Double Pole Rotary Mast for shallow well rotary. For sizes & prices—Write General Tool & Supply Co., P. O. Box 4387, Oklahoma City.

FOR SALE: Two truck-mounted Bettis steam generators; one 30 hp. on a '48 Ford C.O.E.; one 40 hp. on a '41 Chevrolet 4 by 4. Both units completely equipped. Also selling yard and building at Russell, Kansas. Going out of business. Dave Edmiston, Russell, Kans.

LIKE NEW D-13000 Caterpillar. Twin Disc Clutch and Sheave. 5951 actual hours. Price $3500. C. Spitzfaden, Box 2001, Wichita, Kansas, LD 128.

FOR SALE: 1—Baldwin Southwark Horizontal Duplex Pump 4 plunger 5⅜" dia. x 18" stroke 470 G.P.M. @ 1000 p.s.i. 1—Bethlehem Steel Company horizontal pump 3 plunger 5⅜" dia. x 18" stroke 500 G.P.M. @ 1500 p.s.i. 2—Baldwin Southwark Vertical Triplex Pumps (1) 3¼" dia. x 10" stroke 70 G.P.M. @ 1300 p.s.i. (1) 5" dia x 10" stroke 160 G.P.M. @ 500 p.s.i. All of the above arranged for direct motor connection—no motors. Inquire of The Vulcan Detinning Company, Sewaren, N. J.

EQUIPMENT FOR SALE

FOR SALE: 48-L Bucyrus-Erie, Trailer Mounted, Waukesha WAK Motor. 36-L Bucyrus-Erie, Trailer Mounted, Waukesha GK-140 Motor. RL Double Drum Cardwell, Skid Mounted, Waukesha GK-145 Motor. Dog Houses, Light Plants and Tremendous stock of Drilling and Fishing Tools. All equipment in first-class condition and ready to work. Will sell tools or any item separately. Special price to one purchaser for all equipment. This is worth investigating. Box 337, Farmington, New Mexico, Phone 429-W.

NOW working in South Texas area. Cardwell "Mobilehoist" double-drum workover rig, powered with Waukesha gas-gasoline 6MZ engine. 5000′ rig complete with 5000′ 9/16″ swab line, 1″ drill line Brewster 50 ton three sheave block and hook, 7″ x 5½″ double telescoping 55′ pole. Complete with O.C.T. packoff for 2″ and 2⅛″ tubing, substructure, hand tools, etc. Less mud pump. Price $8500.00. Box E-825, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Franchises on a new high speed drilling machine, for drilling oil wells deeper and faster. Basic Patent on drilling machine. Box E-827, The Oil and Gas Journal, Tulsa, Oklahoma.

1—10″ x 11 x 5 Ingersoll-Rand Type XOB air Compressor with 145 Waukesha Engine, extra cylinders and other equipment. 1—12″ x 11 x 5 Type NCTB Two Stage Chicago-Pneumatic Compressor complete with 6 WAK Waukesha Engine. Above located in Las Animas Field 17 miles SW of Hebbronville, Texas. Inquire Industrial Engine Service, P.O. Box 469, Hebbronville, Texas.

FOR SALE: 87′ Lee C. Moore cantilever drilling mast complete with 5′x33′ substructure. Call 2-2055 Oklahoma City, or write 1514 Liberty Bank Building.

1 SUPERIOR 90 hp. twin gas compressor and 1 Superior 90 hp. twin gas engine. Alfred B. Kern, 223 Wright Building, Tulsa, Oklahoma.

1—36-L Bucyrus-Erie Spudder, equipped with Waukesha Mtr., tool house, Junk Rack, Light plant, wire lines, all in good condition. Write R. L. Jeffries, P.O. Box 724, Evansville, Indiana.

Storage Tanks—FOR SALE: Eight—55,000 bbl., steel tanks with steel roofs. Located Henrietta, Texas, on railroad siding. James W. Heath, Henrietta, Texas.

EQUIPMENT WANTED

WILL PAY highest prices for used casing used line pipe, abandoned leases, or other surplus lease equipment. Your idle producing equipment is worth dollars. Green Pipe & Supply Co., Box 1383, Tulsa, Oklahoma.

WE BUY well drilling equipment machines, cable tools, pipe, etc. Turn your surplus equipment into cash. Pressey & Son, Pueblo, Colorado.

WILL pay cash for your surplus equipment — Engines, Generators, and Electric Motors. Brazos Engineering Co., Inc., 224 Raines Street, Phone FAirfax 8367, Houston, Texas.

WILL TRADE 3500 Ft. 7-inch—20# NEW seamless for 5½-inch NEW pound for pound basis. Jay Kornfeld, 1121 Union National Bank Building, Wichita, Kansas. Phones 4-2121—6,0996.

REAL ESTATE

OFFICE SPACE: Large new building. Fireproof, completely air-conditioned, elevator, free parking facilities for you and your customers. Draw your floor plan to suit your needs. Your office will be ready for you 60 days after we get your floor plan. Call or write: Western Chevrolet, Abilene, Texas.

HELP WANTED

PETROLEUM GEOLOGIST

Moderately sized company with active exploration program desires petroleum geologist with minimum of three years' experience, qualified to do subsurface mapping and act as assistant to district geologist in Louisiana and Mississippi. Write, giving details of experience and training and salary desired. Box E-800, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

OIL INDUSTRY Employment Service, 405 Tuloma Building, Tulsa, Okla. 4-5674. Tom Robinson, owner. For technically trained personnel. No fees. Needed now: Natural Gas Distribution Engineer. (We are having success placing experienced LP-Gas men).

HELP WANTED

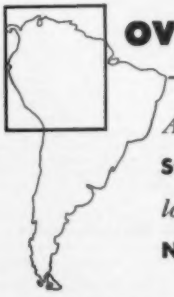
PETROLEUM ENGINEERS, GEOLOGISTS, DRAFTSMEN, CARTOGRAPHERS, needed for Rocky Mountain area positions. We bring employer and qualified applicant together. Professional Placement Service, 516 Univedsity Building, Denver, Colo.

OPPORTUNITIES FOR TECHNICAL REFINERY PERSONNEL for LARGE INTERNATIONAL OIL COMPANY

Entertaining applications of graduate chemical, mechanical, structural and electrical engineers for refinery engineering assignments at home and abroad.

Engineers with refinery experience and also recent graduates will be considered.

Box E-667, The Oil and Gas Journal, Tulsa, Oklahoma



OVERSEAS OPPORTUNITIES

Affiliates of

Standard Oil Company (New Jersey)

located in South America

NEED...

PETROLEUM ENGINEERS:

Positions are now available for graduate engineers experienced in drilling, production, reservoir studies, or petroleum laboratory.

EQUIPMENT INSPECTORS:

Engineering degree and several years oil refinery metals inspection experience. Will inspect oil refinery equipment and request equipment renewals where corrosion, failure, or defectiveness under safety codes makes necessary.

GEOLOGISTS:

Graduate geologists experienced in surface geology are needed as exploration party chiefs. Opportunities also for experienced subsurface geologists and photo geologists.

MAINTENANCE ENGINEERS:

Engineering degree and several years oil refinery or chemical plant experience required. Will work in planning, scheduling, and coordination of oil refinery maintenance and construction.

These are regular staff positions offering liberal salaries and benefit plans.

WRITE

giving complete address, age, marital status, education, and details of previous experience. Box 308-F, Radio City Station, New York 19, N. Y.

HELP WANTED

COMMISSION sales representative in California to introduce oil well service tools. Widely used in southwestern states. Repeat business through supply stores. Box 4426, Dallas, 11, Texas.

SALES Representative now covering Rocky Mountain area, with oilfield or related equipment who can handle a line of pipe-line materials and equipment. Box E-835, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED — SEISMOGRAPH PARTY CHIEF. Must be fully qualified. Age 27-38. A good opportunity for the right man. Box E-770, The Oil and Gas Journal, Tulsa, Oklahoma.

GRAVITY meter operator for foreign assignments. Top salary and living allowances for family. Prefer experience on Worden type meter. Our personnel have knowledge of this ad. Box E-819, The Oil and Gas Journal, Tulsa, Oklahoma.

MAGNETOMETER operator for foreign assignment, top salary, and living allowances, transportation for family. Our personnel have knowledge of this ad. Box E-818, The Oil and Gas Journal, Tulsa, Oklahoma.

KNOW THIS MAN? Average build, good habits, healthy, 35 to 45 years, qualified to manage sales activities of manufacturer of production equipment operating fifteen salesmen. Compensation $10,000. Our client wants letter, giving education, personal and business history. Will arrange interview. Watts, Payne Adv., Inc., 900 South Main St., Tulsa, Okla.

KEY Seismograph Personnel Needed by Established and Expanding Seismograph Company. Box E-816, The Oil and Gas Journal, Tulsa, Oklahoma.

GAS DISTRIBUTION ENGINEER

Growing natural gas company located in north central area has opening for gas engineer experienced either in preparation of material for presentation to regulatory bodies or in gas distribution work, including appliance installation on customers' premises, or both. Salary commensurate with ability and experience. Replies confidential. Box E-832, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

GEOLOGIST: Eight years' experience, desires work with major or substantial independent company. Box E-811, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY SUPERINTENDENT
Competent and experienced. Excellent record efficient operations, maintenance and construction. Box E-810, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST, now employed. Age 29, B.S. Degree, Veteran. Two years extensive experience in three geologic provinces. Prefer position with progressive independent company in Rocky Mountain Area. A sound future and chance for advancement important. Box E-815, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 1628, Ph. No. 3-3141, Hobbs, New Mexico.

WATERFLOOD ENGINEER. Graduate Petroleum Engineer. Responsible secondary and primary experience in Oklahoma, Kansas, Arkansas, Mississippi and Louisiana. Desires work with aggressive independent or small company. Future and advancements important. Box E-824, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST: B. S. Oklahoma. Two and one-half years with small independent and self, doing subsurface, well sitting, report writing, and leasing in North Texas. Desire to become member of independent organization in the North Country; slight preference for Illinois Basin. Thirty-two years old, with family. Box E-822, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

PRODUCTION and Completion Engineer, Oklahoma University graduate; 2 years experience in West Texas and South East New Mexico with independent service company. Desires position with independent production company. Age 25. Available for interviews immediately. Box E-839, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST-GEOPHYSICIST: Eight years surface, seismic interpretation, subsurface, reserves work; last six Venezuela; desires permanent location Denver, subsurface and reserves calculations. Graduate, veteran, married, 32. Box E-813, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION SUPERINTENDENT. Graduate Petroleum Engineer, 12 years responsible experience producing industry. Geological ability. Mid-Continent or Rocky Mountains. Box E-774, The Oil and Gas Journal, Tulsa, Oklahoma.

MICROPALEONTOLOGIST - Geologist. 25 years experience Mexico, Venezuela, California. Dissatisfied present position. Desires change. Box E-833, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN: Experienced land, lease, title, and contract negotiator. College Graduate, age 32. Currently in managerial position with Major in Williston Basin. Desires affiliation with progressive independent. Box E-828, The Oil and Gas Journal, Tulsa, Oklahoma.

INDEPENDENT exploration and research geologist desires retainers. Experienced in West Texas, New Mexico, Central Texas, North Texas, Oklahoma and surrounding areas. Located in Fort Worth. Box E-826, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTORNEY, experienced in land and title work, Federal income tax laws, legal investigations, now employed, desires position where legal ability can be used productively. Box E-825, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

FOR SALE: Well located government leases in 111 W., 41 N., 42 N., 44 N. Wyoming. Box E-830, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES ROYALTIES
Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited
B. D. BUCKLEY
6635 Delmar Ave., St. Louis 5, Mo.

NORTHWESTERN NORTH DAKOTA LEASES AND MINERALS

Our latest lists with prices, mailed on request. Will also buy acreage where you want it. Any place in Northwestern North Dakota. References exchanged.

BORSTAD & FITZMAURICE
Oil Properties
4th Floor 1st National Bank Bldg.
Phone 40-226 Minot, North Dakota

LEASE AND DRILLING BLOCKS

FOR SALE: Two producing wells in Mattoon, Illinois, field. All equipment in good shape. P. O. Box 833, Decatur, Illinois.

1504 MINERAL Acres for Sale by an Estate under 3,329 acres, located in Kearny, Gove, Scott, Greeley, Sherman counties, Kansas. $5.00 per acre. Will deal direct or through Royalty Brokers. Leonard Waddell, 1002 Walnut, Kansas City, Mo.

WE invite inquiries from persons interested in Oil and Gas Leases in Southern Alberta, North Central Montana and the Williston Basin. Box E-664, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL pay cash instantly for leases (large blocks), royalties, mineral deeds, production. Write fully—P. O. Box 2153, Denver, Colorado.

OIL LEASES: A number of 160 and 640 acre tracts in Grant and western North Dakota counties, reasonable. Write P. O. Box 344, Carson, North Dakota.

DRILLING BLOCK

10,000 acres with supporting geological data and geophysical data. Priced at $1.50 per acre with one-sixty-fourth override and well to be drilled to 2000 T.D. within 30 days after acceptance.

Box E-836, The Oil and Gas Journal, Tulsa, Oklahoma

WATER FLOODING LEASE

300 acres in the middle of production and current planned water flooding program. Sand pay 15 to 40 feet thick, 380 to 400 feet deep. Such excellent prospect that we will give 30 day coring option. Box E-834, The Oil and Gas Journal, Tulsa, Oklahoma.

CAPITAL AVAILABLE

Interested in leases for drilling in oil producing or adjacent properties. Must be in North or South Dakota. Write

GREAT NORTHERN STEEL CO.
Foshay Tower, Minneapolis, Minnesota

80 ACRES, 1300' from shallow sand production. No dry holes between. Will drill well for half interest to 1100 for $4,000 within 30 days. Box E-838, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLING BLOCK

3,500 acres priced at $7.50 per acre, supporting geological data, 1/16th of ⅞'s override, well to be drilled to 4200', to start on or before October 1st, 1952.

Box E-837, The Oil and Gas Journal, Tulsa, Oklahoma

100,000 ACRES LEASE

Southwestern Alabama

Large lumber company has approximately 100,000 acres of unleased land located between the Pollard Field and Mississippi Production. Includes several known geophysical structures. Wish to contact major company or substantial independent operator capable of developing this large property. Will deal only with principals.

Box E-831, The Oil and Gas Journal, Tulsa, Oklahoma

ROYALTIES

FOR SALE

WELL LOCATED landowners royalty in Roberts County, Texas, near the Gulf-Haggard wells. All under major company leases. For information to Reliable people, communicate with

COMBEST ROYALTY COMPANY
825-826 Amarillo Building
Amarillo, Texas

PRODUCTION
We Will Buy

PRODUCING landowners royalty and producing leases. Any amount, any area. Confidential information required and furnished. A 1 Bank Reference.

COMBEST ROYALTY COMPANY
825-826 Amarillo Bldg.
Amarillo, Texas

BUSINESS OPPORTUNITIES

10,000 FOOT test proposed for South Georgia as result Geophysical work recent months. For details write C. W. Deming, Waycross, Ga.

FOR SALE MAPS

OWNERSHIP MAPS
All of Eastern Montana in Williston Basin
UP-TO-DATE Complete Coverage
EDWIN Z. SNYDER MAP SERVICE
312 Treasure State Bldg.
Billings, Montana
P.O. Box 1648 Phone 9-1824

WILLISTON BASIN MAPS
JUST COMPLETED
COVERING: North Dakota, South Dakota, East Montana, Northeast Wyoming.
SHOWING: Structures, Township and Range, County Outline, County Seats. All wells drilled or drilling. Total depths, Completion Dates, Operators' names. Size 42" x 54".
Price $8.00 Paper, Linen $17.50
Individual County Ownership and Lease Maps
(Twenty-three county maps in stages of completion in the Basin.)
Scale: 1 inch equals 4,000 feet
Published and for sale by
NORTHWEST MAPPING CO.
117½ Fourth Street Phone 3457
Bismarck, North Dakota

Kansas Fields

(Continued from page 151)

SE SE NW 25-24s-16w, dry, TD 4,678 ft.

Ellis County: Brunson 1 Hoff, SE SE NW 18-12s-16w, dry, TD 3,621 ft.

Virginia 1 Bruli, SW SW SW 19-13s-18w, dry, TD 3,717 ft.

Graham County: Davis Bros. 1 Gosselin, SE SE NW 5-8s-21w, dry, TD 3,648 ft.

Hodgeman County: Texoma 1 Nilhas, NW NW NW 18-22s-25w, dry, TD 5,246 ft.

Logan County: D. R. Lauck 1 Briggs, NE NE NE 35-13s-33w, dry, TD 4,688 ft

McPherson County: K&E-Appleman 1 Olson, SW SW SE 2-16s-4w, dry, TD 3,670.

Norton County: Keating 1 Wesley, NW NW NE 4-3e-23w, dry, TD 3,627 ft.

H. Gore 1 Voss, SE NE NE 10-5s-22w, dry, TD 3,605 ft.

Pawnee County: Transit Corp 1 Wurm, NW NW NE 34-23e-16w, dry, TD 4,220 ft.

Rice County: Flynn 1 Gray, NW NW SE 17-19s-8w, dry, TD 3,456 ft.

Rush County: E. H. Adair 1 Schneider, NE NE SE 7-18s-18w, dry, TD 3,963 ft.

Strain et al 1 Irwin, SW SW NE 30-17s-20w, dry, TD 4,327 ft.

Sheridan County: Anschutz 1 Andregg, NW NW NW 2-7s-26w, dry, TD 4,472 ft.

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Central Area

(Continued from page 152)

Knox County: Joe Bander 1 Roberts-Hill, Military Donation 184-4n-9w, dry, TD 1,656 ft.

Putnam County: J. Walker 1 James, S½ SW NE NE 17-14n-4w, dry, TD 1,987 ft.

Sullivan County: C. S. Cooksey 1 Wible, 330 ft. from SL and 610 ft. from EL SE SE 9-9n-9w, dry, TD 2,200 ft.

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: F. M. Ashby et al 1 Howard, NE SW NE 15-O-32, dry, TD 1,092 ft.

Grayson County: G. E. Winn 1 Eskridge, NE SE NW 1-L-37, dry, TD 600 ft.

Henderson County: W. F. Lacy 1 Tapp, NE NE NW SW 3-N-24, dry, TD 2,590 ft.

Hopkins County: Skiles Oil Corp. et al 1 Firdine, SW NW SW SW 8-K-26, dry, TD 2,761 ft.

Ohio County: Paul McBayer at al 1 Ernst, SE SW SW NE 15-O-33, dry, TD 770 ft.

Todd County: L. B. Halferty 1 Gill, SL SW NE SW 21-D-29, dry, TD 1,273 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Health Township: W. E. Wyse 1 Ter Avest & U. S. A. Comm., NE SE SF 10-3n-14w, Traverse 1,560 ft., dry, TD 1,581 ft.

Kent County, Bowne Township: Skelly Oil Co. 1 Alto LPG Storage, NW NE NW 3-5n-9w, dry in Salina to be washed out for artificial LPG storage reservoir, TD 3,960 ft.

Lake County, Dover Township: Union Development Co. 1 Kellogg Est., NE NE NE 1-20n-11w, Stray sand 1,259 ft., dry, TD 1,346 ft.

Lapeer County, Deerfield Township: Graham Wilcox 1 Schultz, SE SE NW 20-9n-10e, Berea 1,455 ft., dry, TD 1,515 ft

Livingston County, Marion Township: Forest Squires 1 Martin , NW NW NE 1-2n-4e, Dundee 825 ft., dry, TD 950 ft.

Oscoda County, Evart Township: Sun Oil Co. 1 Hinkley et al, SW NE SE 33-17n-8w, Stray sand 1,580 ft., dry, TD 1,590 ft

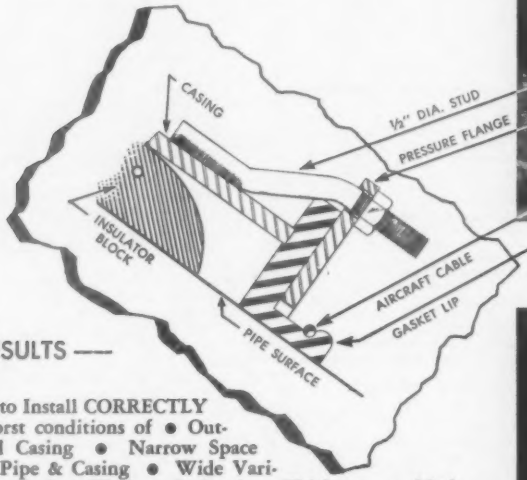
Tuscola County, Arbela Township: Graham Wilcox 1 Loomis, SE NE SW 30-10n-7e, Berea 1,495 ft., dry, TD 1,526 ft.

Van Buren County, Geneva Township: Oliver J. Hosier 1 Labs, SW NE SW 14-1s-16w, Traverse 1,090 ft., dry, TD 1,115 ft.

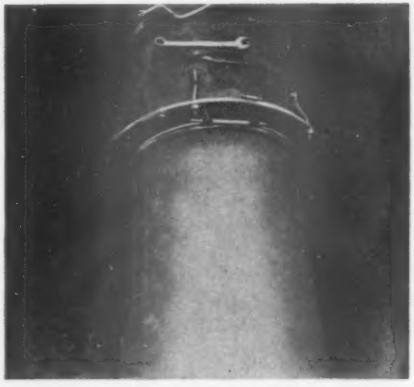
PIPE-LINE TESTED, PROVED and ACCEPTED in '51

TYPE "L" WmSEAL CASING BUSHING*

A New Design: It BUTTS Against End of Casing Instead of Fitting Inside the Casing.



Assembling cable with rubber-covered union for clamping gasket lip to pipe.



THE COMPLETED INSTALLATION
Note that galvanized cable and union are insulated from pressure flange and from pipe.

RESULTS —

1. Easier to Install CORRECTLY under worst conditions of • Out-Of-Round Casing • Narrow Space Between Pipe & Casing • Wide Variations in Casing Wall and Coating Thickness • Mud • Casing ends beveled — by machine or hand torch.
2. WATER-TIGHT Seal with "L" gasket . . . . . .
   - BUTTED AGAINST CASING as pressure flange is tightened on ½" studs welded to casing.
   - TIGHT TO THE PIPE as aircraft cable (4,600# tensile) is tightened to gasket lip. Union is rubber covered to INSULATE galvanized cable assembly from bare casing structure.
3. Always Insulated from the pipe line when a Concentric-Support Insulator is installed just inside casing after the "drag section" is in place.

AS STRONG & DEPENDABLE AS THE MEN WHO INSTALL THEM

REPRESENTATIVES

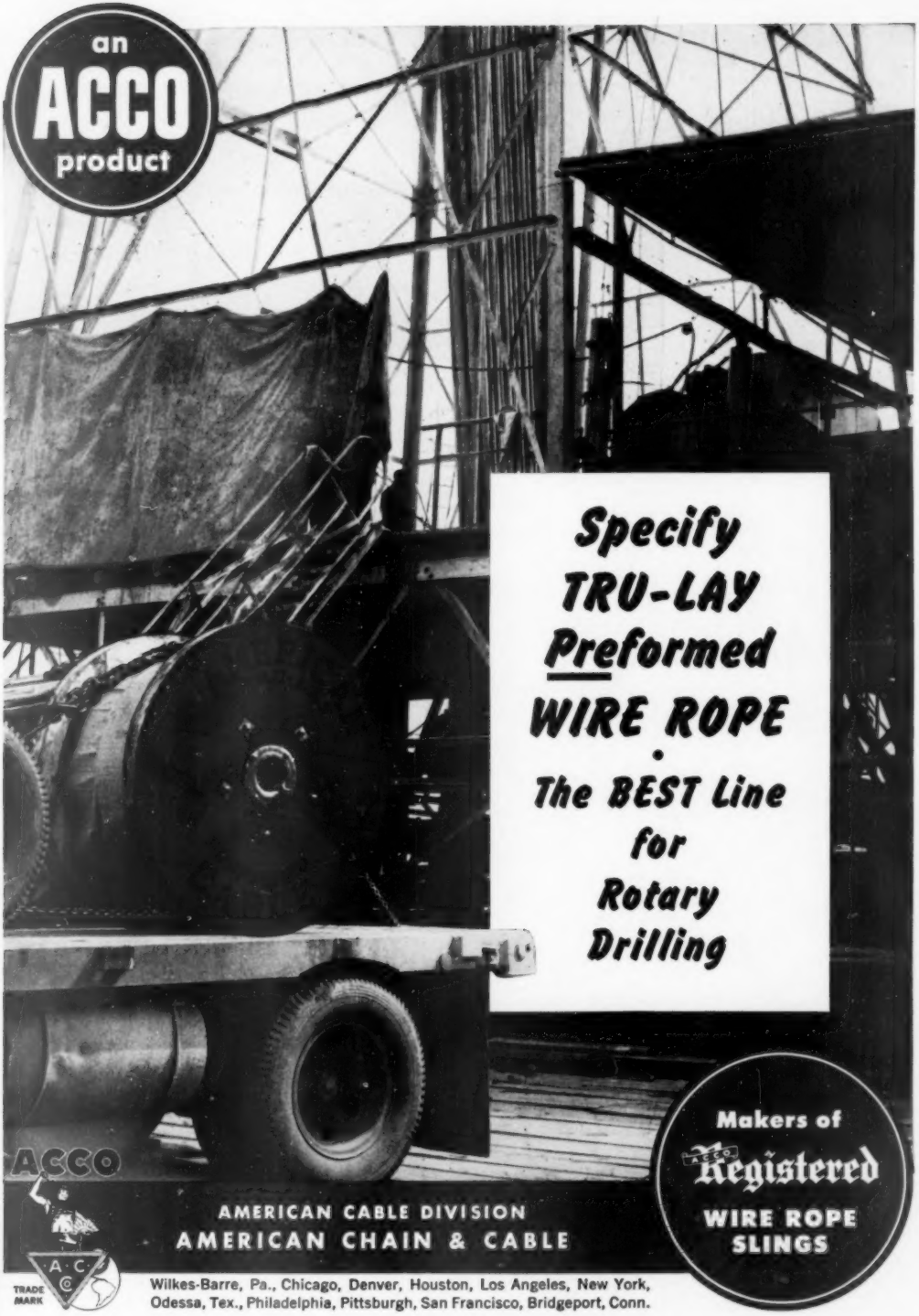
Stuart Steel Protection Corp. Kenilworth N. J. | H. E. Davis Los Angeles 15, Calif. | James S. Kone Co. Amarillo, Texas | Keyes Tank Co. Provo, Utah | Keyes Tank & Supply Co. Casper, Wyoming | Canadian Equipment Sales & Service Co., Ltd. Edmonton, Calgary, Toronto, Canada

*Patent Pending

WRITE FOR BULLETIN 249A

T. D. Williamson, Inc.
TULSA 9, OKLAHOMA

8,000 Pipe Line Casings installed in 1951 with Williamson Bushings and Insulators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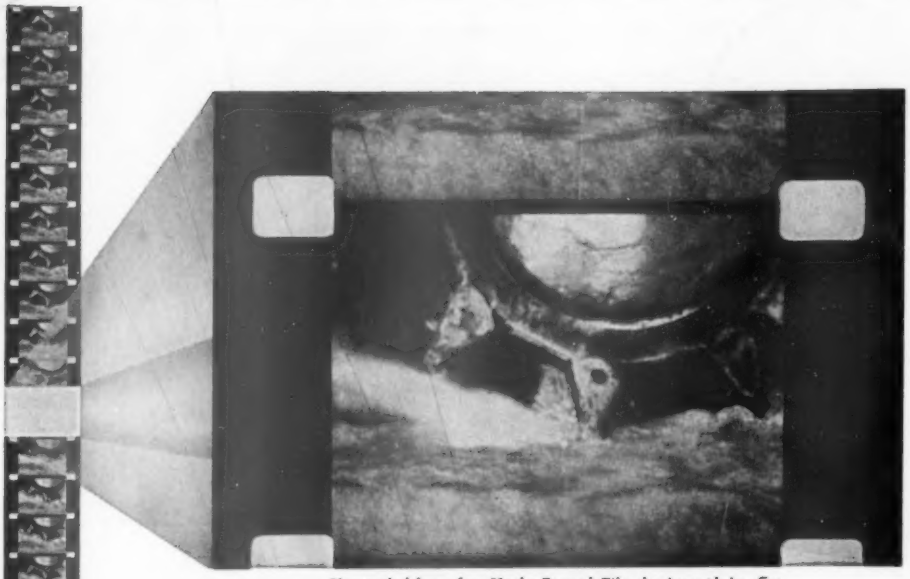

Unretouched frame from Hughes Research Film showing explosive effect as heel tooth penetrates formation.

Hughes advances tooth action research

Knowing exactly what happens when bit teeth bite into the formation is essential in perfecting bit design.

Every means that will clarify tooth action is used by Hughes engineers. This includes the study of bottom hole patterns, data obtained from millions of bits run on thousands of rigs, and motion pictures taken with super high speed camera equipment.

This is work in which small improvements are important. For instance, a design change that leads to the removal of 1/64" more formation on each revolution of the bit can increase the penetration rate approximately five feet per hour at a rotary speed of 60 to 70 RPM.

The study of tooth action is part of HUGHES' overall research program dedicated to the idea that *improvement is a continuing process*... and that the perfect bit is still to be built.

HUGHES Tri-Cone® ROCK BITS